



FRIDAY, FEBRUARY 4.

NEWS OF THE WEEK.

We give below, in a condensed form, the leading news items of the week. These items will be found in detail in their appropriate columns.

MEETINGS NEXT WEEK.—Providence & Worcester in Providence, R. I.—Central Traffic Association.

ELECTIONS.—Atchison, Topeka & Santa Fe extends jurisdiction of officers over Atlantic & Pacific and California Southern.—Central of Georgia, Wm. Rogers Assistant to the President; M. S. Belknap, General Superintendent.—Central Railroad Club elects R. H. Soule President, and other officers.—Chicago & Eastern Illinois elects F. A. Peters a director.—Galveston, Sabine & St. Louis elects Nelson S. Eaton President; R. J. Evans, General Manager.—New York, Lake Erie & Western, George De Haven, Assistant General Passenger Agent.—New York & New England, A. A. Jackson, Assistant to the Vice-President.

PERSONAL.—T. R. Gabel, Acting General Superintendent of Atlantic & Pacific, resigns.—C. C. Wrenshall, Engineer Maintenance of Way of Northern Pacific, resigns to go to Alabama.—Dead: Wm. Scott Gerrish, formerly on the Erie, Daniel McKenzie Kendrick, General Passenger Agent New York Central, Royal B. Jennings, Treasurer, Chicago, Milwaukee & St. Paul.

EARNINGS.—For December 14 roads report gross earnings showing increases and 3 decreases. Eleven report net earnings, 7 showing increases, 3 decreases, and one a deficit both this and last year. For January 3 roads report, all showing increase.

TRAFFIC.—Anthracite coal shipments, 489,762; Eastern bituminous, 258,798; coke, 91,034 tons.—Chicago shipments eastward last week 43,396 tons.—Cotton receipts five months at interior points, 1,986,069; seaports, 4,346,172 bales. Cotton in sight to Jan. 28 was 5,313,215 bales.—Petroleum production, 1886, in New York and Pennsylvania was 26,381,596 barrels; shipments, 26,653,832 barrels; stock, Dec. 31, was 34,156,605 barrels.—Southwestern Association will meet to consider effects of interstate commerce bill.—Southwestern Association roads threaten war on account of interference with Kansas City business.

CHANGES AND EXTENSIONS.—Chicago, Burlington & Northern makes surveys for extension from Galena to Shullsburg.—Cincinnati & Eastern will build extension to Gallipolis.—Columbia & Puget Sound begins work on extension to the Susquahanna country.—Maine Central will extend double track and build union station in Portland.—St. Louis, Arkansas & Texas making surveys for extension to St. Louis.—Tombigbee makes surveys from Columbus, Miss., to Tennessee River.—Williamsburg & North Adams (Mass.) makes surveys.—Wilmington & Wrightsville will begin work at Wilmington, N. C., shortly.—New track reported for week, 95; year to date, 155 miles.

LEASES, SALES, ETC.—Boston & Maine introduces bills to authorize purchase of Eastern road.—Chicago, Burlington & Northern wants use of Duluth & Duquaine Bridge.—Housatonic Valley offers to buy New Haven & Derby road.—Ohio & Mississippi ordered to resume passenger service on Springfield Division.—Philadelphia & Reading express business turned over to Adams Express Co.

FORECLOSURES AND REORGANIZATIONS.—Atlantic & Pacific 6s (all but \$500,000) deposited for conversion into new 4s.—Indiana, Bloomington & Western application for final decree of foreclosure.—Little Rock, Mississippi River & Texas sold to Jay Gould.—Michigan & Ohio foreclosure sale confirmed.—Philadelphia & Reading general mortgage bondholders offer new plan of reorganization.—Shenandoah Valley bondholders' committee issues circular.

NEW COMPANIES ORGANIZED.—Atlanta & Red River, at Atlanta, Tex.—Chattanooga & Southeastern, at Chattanooga, Tenn.—Chicago, Oklawaha & Kansas City, at Chicago.—Cincinnati, Florence & Aberdeen, at Florence, Ala.—Denison, Benham & New Orleans, at Denison, Tex.—Detroit, Charlevoix & Escanaba, at Charlevoix, Mich.—Emporia, Winfield & Fort Smith, at Emporia, Kan.—Hudson Connecting, at Poughkeepsie, N. Y.—Worcester & Hudson, Worcester, Mass.—New Albany & Eastern, at New Albany, Ind.—Poughkeepsie Connecting, at Poughkeepsie, N. Y.—Rome & Carthage, at Rome, N. Y.—St. Cloud, Duluth & Ortonville, at St. Cloud, Minn.—St. Louis & Missouri Central, formed by consolidating Central Missouri and St. Louis & Kansas City Short Line.—Sacramento Valley & Humboldt Bay, at San Francisco, Cal.—Union Pacific files articles for 12 new branches in Kansas.

IN CONGRESS.—Bill to permit a railroad bridge at the Sault Ste. Marie reported favorably.—House passes bill to authorize cable railroads in Washington.

REPORTS AND FINANCIAL.—Camden & Atlantic for 1886 shows increase of 7.8 per cent. gross, but decrease of 3.6 per cent. net.—Cincinnati, Hamilton & Dayton, nine months to Dec. 31, earned \$2,309,022 gross and \$919,345 net. Dividends, 6 per cent.—Delaware, Lackawanna & Western for 1886 shows dividends of 4 per cent. gross, decrease of 6 per cent. net; dividends, 7 per cent.—Detroit, Lansing & Northern for 1886 shows very small decrease in gross, gain of 9 per cent. net; dividends, 7 on preferred and 3 per cent. on common stock.—Pittsburgh with issue new preferred stock to present shareholders.—Memphis & Charleston, half-year to Dec. 31 shows gain of 16½ per cent. gross and 24½ net.—New York, Lake

Erie & Western, three months to Dec. 31 shows gain of 8½ per cent. gross and 9½ net.—New York & New England, three months to Dec. 31 shows increase of 9½ per cent. gross and 16 net.—Norfolk & Western for 1886 shows increase of 17 per cent. gross and 15 net.—Pennsylvania for 1886 shows gain of 10½ per cent. gross and 10 net. Western lines gained \$1,152,711 over 1885.—St. Louis, Vandalia & Terre Haute for 1886 shows gain of 7.8 per cent. gross and 3.6 per cent. net.—West Jersey for 1886 shows increase of 5.2 per cent. gross and 5.6 net; dividends, 6 per cent.

Western Railway Club.

At the January meeting of the Western Railway Club, in Chicago, the opening discussion was on the

HEIGHT OF DRAWBARS.

Mr. RHODES said: The recommendation of the committee at the Niagara convention that the standard height should not exceed 35 in. when car is empty, and be not less than 39 in. when car is loaded, failed to receive the endorsement of the convention mainly because the committee had not investigated fully enough, only 24 roads being mentioned by them, whereas there were 76 having representative members in the convention. Mr. Rhodes therefore moved that a committee be appointed "to report to this association the height of empty freight cars from centre of drawbar to top of rail of all roads in the M. C. B. Association, together with the number of cars owned by each road; and also of such lines as have signed the interchange rules, or who have adopted the code of interchange rules as published in 1886."

President SCOTT approved the motion, and said his road had recently considered the question of building cars an inch or two higher, but found that bridges were likely to be found too low, and that the limit was nearly reached. The draft line is too high. The motion was carried, and the President appointed as the committee Messrs. Rhodes, Barr and Riley.

ON THE SUBJECT OF WEIGHT OF DRIVING-WHEEL CENTRES AND TIRES.

A letter was read from Mr. John Hickey, M. M. of the Milwaukee, Lake Shore & Western, referring to the fact that the great weight of the wheels had no springs to ease its shocks; and adding to this too rigid or too weak springs often used made the shocks to the permanent way a very serious matter. Mr. Hickey's experience led him to believe that "since we increased the weight of driving axles, driving boxes, rods, counter balances, wheel centres and tires, the mileage per 1-16 in. wear is much less than it was when these articles were made lighter. And it will be admitted that in a large majority of cases the miles per 1-16 in. wear on front driving tire is less than the miles made to the same wear on a back tire, caused, no doubt, by the increased weight of counter balance, main connections and eccentric, necessary additional weight on front wheels." Mr. Hickey had tested a certain set of tires "to compare its wearing qualities with the tire we had in use. I found it averaged 8,890 miles per 1-16 in. wear before first turning. I found some cracked spokes and defects in some of the other wheel centres. This, with the opinion that the wheel centres were too heavy for the weight of the engine, caused the rejection of all of them. Another pattern being substituted, was 400 lbs. less weight than the old one, making a total of 1,600 lbs. less in the four wheels. The amount of difference in weight of wheel centres being considered necessary for proper adhesion, it was attached by means of cast-iron slabs to the deck plate and other parts of the frame, where it had the benefit of springs. The old tire being now placed on the new wheel centres, and receiving the first turnings, the engine was placed in the same service she had been prior to her advent into shop. A correct record of the wear of tire, after this, showed that the engine ran an average of 11,257 miles to the 1-16 in. wear, or 2,367 miles more than before first turning, and when she had the heavier wheel centres.

"Between the second and third turnings, the average miles to 1-16 in. wear was over 1,000 miles more than made before turning. The lowest mileage per 1-16 in. wear was made by a part of the tire where the highest mileage was expected. No change was made other than a reduction in the weight of wheel centre, together with the amount taken off the tire, to true it up at its first turning. I do not claim for a certainty that the greater mileage was obtained through the reduction of weight of wheels and tire, but it looks as if it were at least partly responsible for it."

President SCOTT: Our record shows that the 4-in. tire has not made quite as much mileage as the 3-in., as Mr. Rhodes decided in his report. Taking ten freight engines, with 8-in. tire, and ten engines that were in passenger and freight service with 4-in. tire, we have a mileage to the sixteenth with the 3-in. tire of 9,092, and a mileage to the sixteenth with the 4-in. of 8,103—that is the average of ten engines. On switch engines the 3-in. tire gives us 4,449, the 4-in. tire about 4,000, there being very little difference. We are going to verify our statistics and hope to be able to make a more correct report on this basis than this. Before giving any further facts on it, I should prefer to collect further statistics. This is very near the mileage reported by Mr. Rhodes as between the 4 and 3-in. tire.

Mr. RHODES: Some years ago the Pennsylvania Railroad fitted up some engines with wrought-iron spoke driving wheels, and it would be interesting to hear from them whether these wheels have given more wear per sixteenth in proportion to the load on the drivers than their cast-iron centres. The difference in the weight of each driving wheel bears so little relation to the actual load on that driving wheel that it ought not to affect the wear of the tire in the way Mr. Smart and Mr. Hickey anticipate.

President SCOTT: It is difficult to get at these statistics very accurately, because some roads are using the so-called Ross shoe and other roads are not using it, and we do not learn in all these reports whether they were using these shoes or not. All these things enter very largely into the wear of a tire.

Mr. RHODES: The statistics that I gave were all based on the wrought-iron shoe. We cannot yet report on the Ross shoe.

Mr. MACKENZIE: We all make a mistake in the manner in which we keep the records of the miles the tires make. The records that we get from our shop men are not satisfactory at all, and we are endeavoring to get up an instrument or something that will show the tire wear before it is turned or at any time when the engine is in service. If we can do that we can get miles per sixteenth at any time we wish, and not have to depend upon a man to take the engine into the shop and measure and figure on it. I think we will get it more accurately if we get it every two or three months, for instance, while the engine is running, not taking the wear from the time the engine was turned until it was turned again. There might be a great many different conditions in the use of the engine during the time we take the mileage, so that you could make no comparison with another engine.

President SCOTT: Our road is not prepared to admit that the 4-in. tire is not just as good as the 3-in., from any statistics we have yet produced or from any produced by anybody else. We wouldn't like to go on record as assuming that

there is more wear and better service in a 3-in. tire than there is in a 4-in.

Mr. COOPER: It is unfair to compare the wear of the tire with a light rail with the wear of the one with a heavy rail.

Mr. COOPER: We find that on our moguls the middle wheels wear faster than the end wheels.

Mr. MACKENZIE: We have some ten-wheel engines; and after six or eight months it is common to find a difference of wear of ½ in. between the back and middle drivers. The only way that we can account for it is that there is more weight on the back drivers. We sometimes find a difference of nearly ¾ in. between the front and back ones.

Mr. COOPER: Our middle wheels invariably have been the smallest, and with the equalizers between the centre wheels I should think the weight would be well distributed.

Mr. JOHNSON: Referring to the point that Mr. Hickey makes relative to the wear of the tire being greater with the lighter wheel, it might be attributable to the fact that the lighter wheels were much better counterbalanced than the heavier. He should have given us more light on the subject of how the wheels were counterbalanced.

Secretary SINCLAIR: It makes a great difference whether the weight is above or below the springs. Every one knows the difference between the destructive force of a cushioned and an uncushioned blow. You know that a car without springs would be more destructive on itself and on the track than one with springs. In the same way it becomes merely a matter of proportion, with having heavy driving-wheels that have no spring between the blow they give and the track. When driving-wheels are comparatively light the injury might be trifling. Every addition that you have put into the material is bringing that destructive blow into prominence, and it may be that the very heavy wheel is now beginning to show itself in that way. I hold that a set of heavy driving wheels has precisely the same action (whether there is a weight above them or not), that a comparatively light car would have rushing along the track with no springs under it. A set of heavy driving wheels are as heavy as a light car, and if you proposed to run your light cars without springs you would pretty quickly hear a protest from the engineering department of the road against it.

Mr. MACKENZIE: We have hundreds of cars that, if the limit was put into them, would have no more action to them than so much wood, and we don't hear any complaints about it.

Mr. BARR: We cannot theorize on the matter at all. If we can take two engines and equip one with light wheels, including tire, and the other with a heavy one, and have the same condition of track, we might be able to form some conclusion. Further discussion on this subject was postponed until the February meeting.

INTERCHANGE RULES 12, 13 AND 14.

Mr. RHODES: We have for consideration to-day rules 12, 13 and 14, all relating to bills for wheels and axle work.

The main point to consider in rule 12, is whether any change should be made in the prices. Many companies undoubtedly are both purchasing and making 555 pound 33-in. wheels for \$7.50 each, and if such wheels are put under foreign cars and charged at \$10 there is more profit than is contemplated under the rule. We doubt, however, whether there should be any change in the present prices. It has not yet been shown that cheap cast iron wheels can be economically used, and it is not desirable to force companies that are buying good material to purchase cheaper goods in order to be able to repair foreign cars without loss. On our line the actual cost and scrap value of wheels and axles are as follows:

	Weight.	N. W.	Scrap.
1 33-in. wheel.....	555 lbs.	\$9.35	\$4.06 at \$17 per gross ton for 535 lbs.
1 30-in. ".....	485 "	\$8.50	\$3.55 at \$17 per gross ton for 465 lbs.
1 M. C. B. iron axle....	335 "	(at \$2.35) \$9.05	\$4.87 at \$26 net ton for 375 lbs.

Referring to rule 13, a form for wheel bill-heads was first introduced at the Saratoga convention in 1884, and has been a source of wide dispute ever since. The object in having a standard form of bill-head is to expedite the approval of wheel bills by having columns properly headed and thereby call attention to the requirements of the rules as the bills are made. In adopting a standard blank it is important that a size be selected of papers usually carried in stock.

The ordinary sizes are 14 x 17; 16 x 21; 17 x 22; 18 x 23; 19 x 24; 17 x 28. These sheets can be cut into two, four or eight blanks each.

We are not prepared at present to submit a form of heading. (Three different headings, one used by the Atchison, Topeka & Santa Fe, one as used by the Pennsylvania Railroad, and one used by the Chicago, Burlington & Quincy, which conforms to the Master Car-Builders' recommendation of 1886, were exhibited, and are now in the hands of Secretary Sinclair. A form recommended by the chief clerk of the motive power department of the C. B. & Q. was also shown.)

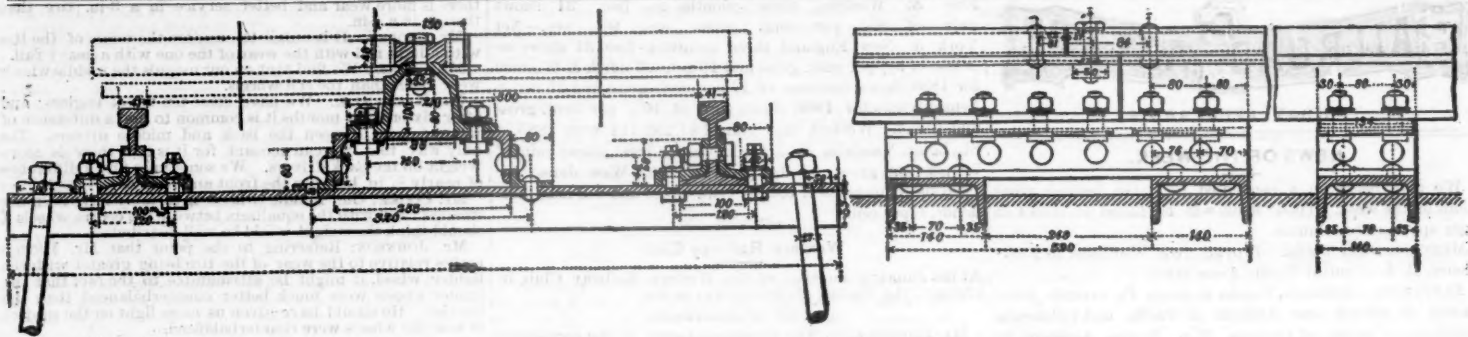
The term, "worn flat," has received a good deal of unnecessary comment. It has been said that there is no such thing as a worn flat spot; that the rule should make it obligatory to state how worn flat spots are located with reference to each other; that cases have arisen where a car delivered in good condition has developed worn flat spots before it has gone 50 miles. In other words, it has been plainly intimated that bills have been rendered for "slid flat wheels" under this rule, and we are asked to frame it so as to prevent this dishonesty. It can't be done. No master car-builder rule will ever prevent dishonesty. Our advice, where any line thinks dishonest bills are being rendered, is that they take special measures with the master car builder of such road to try to locate the matter.

Mr. WAGGONER, chief clerk Pan Handle road, thought as there was no way of preventing dishonesty if roads were inclined to be dishonest, the rules should be framed with the idea of putting the roads upon honor. There was more information required by the bills than was necessary, so much that people would not take the trouble to give it.

Mr. BARR thought this form of bills better adapted to secure fair treatment between roads than any other that had been used. He had passed bills that called for both wheels worn flat, wheels that were comparatively new. He strongly suspected that the wheels were slid flat and not worn flat; but passed the bills and called the attention of the parties to it, and had received no more such from them. He thought the bill a good practical working bill.

Mr. VERBRYCK said that inspectors on his road might report a pair of wheels worn flat, but he had a check on them. He hung wheels and axles at only one place, his main shop, and he had all the wheels brought in there when his inspectors reported a pair of wheels taken out of a foreign car, and they were inspected before the bill was made out, and he had never had a bill rejected. Some roads persisted in sending in bills, say for a cracked wheel, and without giving them length of the crack and he had been obliged to send them back frequently. He had no doubt such roads were perfectly honest, but their clerks were negligent.

Mr. SMITH, chief clerk C. C. & L. described the form used in his office. It contained most of the requirements of the master car-builders' rule, printed, with proper blanks to be filled in, such as cost of wheel, cost of axle, cost of labor



Cross Section. Longitudinal Section.
RACK AND PERMANENT WAY—MOUNT PILATUS RACK RAILROAD.

etc. By having it printed there was a great deal of labor saved.

Mr. MACKENZIE said that on his road they did not allow inspectors to make bills, but required them to stamp on the wheel the number of the car. The inspector keeps that number in his book, and the road has it in the shop. He thought, after all, about the only fault to be found with the bill was its size. They received them of every imaginable size, and they were very inconvenient to handle or file.

Mr. RHODES moved that the words "worn flat," in the first section of rule 14, should be erased, and that the expression should be "worn through the chill." Seconded. After some discussion the motion was lost.

Each section of rule 14 was then adopted as expressing the sense of the meeting.

Mr. BARR moved that it be the sense of this meeting that he term "tread worn hollow" should be added to the list in rule 14. Carried.

Mr. BARR moved that the term "seams," with the proper explanation, should be added to the list. Mr. BARR stated that he had passed a number of bills containing that expression. The motion was carried.

Mr. RHODES moved that it be the sense of this meeting that the prices for the 36-in., 33-in. and 30-in. wheels and the charge of \$1.50 for labor and the axle, as given in rule 12, should stand. Carried.

Mr. BARR moved that it be the sense of this club that the information required by the form of bill as printed in the circular in rule 13, covers the ground, and is satisfactory, if not in shape, in contents. Carried.

On motion of Mr. Rhodes rule 13 as a whole was adopted as expressing the sense of the meeting.

Mr. MACKENZIE moved that in the opinion of the club the form of bill should be 7x8 $\frac{1}{2}$ and 8 $\frac{1}{2}$ x14. Carried.

At the next meeting of the club interchange rules 15, 16, 17, 18, 19, 20 will be discussed, Mr. Barr being the first speaker; and Mr. Smart will open a discussion on weight of driving wheels and unbalanced parts.

The Central Railroad Club.

A meeting was held in Buffalo on Jan. 26, for the purpose of organizing a railroad club on somewhat similar lines to the New England and Western railroad clubs, meeting every month in Boston and Chicago respectively. As the roads running near Lake Erie receive an unusually large proportion of foreign cars, they are naturally much interested in the Rules of Interchange, the discussion of which will doubtless form a leading feature at the meetings of the club. For some years past informal meetings of master car-builders have been held at the Tift House, Buffalo, and the formation of the new club promises to place similar future gatherings on a formal basis.

Among those in attendance were: B. K. Verbryck, of Chicago (Chicago, Rock Island & Pacific), President of the Master Car-Builders' Association; J. W. Stark (Toledo); F. D. Adams (Boston & Albany); Robert Potts (Michigan Central); R. H. Soule (Erie); John S. Lentz (Lehigh Valley); John Kirby, J. S. Graham and A. C. Robson (Lake Shore & Michigan Southern); E. Chamberlain (New York Central, Buffalo shops); J. D. McIlwaine, William McWood, W. Allison and T. Rhodes (Grand Trunk); T. Sutherland and J. Atkinson (Chicago & Grand Trunk); W. F. Turreff (Cleveland, Columbus, Cincinnati & Indianapolis); W. E. Rockefeller (Rome, Watertown & Ogdensburg); John Turner (Michigan Central); R. C. Blackall (Delaware & Hudson); C. J. Butler (Fall Brook Coal Company); James McBeth (West Shore); John Medway (Boston, Hoosac Tunnel & Western); John Garvey (New York, Chicago & St. Louis); A. Strauss, W. Anderson and E. H. Bowen (Pennsylvania & New York); F. B. Griffith (Delaware, Lackawanna & Western); C. W. Mills and C. H. Newman (Buffalo, Rochester & Pittsburgh).

After considerable discussion a constitution was adopted and the following officers elected: President, R. H. Soule, Buffalo; Vice-President, T. Sullivan, St. Thomas, Ont.; Secretary and Treasurer, E. Chamberlain, Buffalo; Executive and Financial Committee, R. H. Soule, Chairman; E. Chamberlain, W. F. Turreff, F. B. Griffith, John Kirby, R. C. Blackall.

The headquarters of the new club will be in Buffalo, and its territory will be more especially confined to the railroads radiating from Buffalo, Cleveland, Detroit and Toledo, but railroad men from any part of the country, if engaged in constructive and operative work, are eligible to membership. Its purpose is to promote knowledge concerning the operation, repair and construction of railway appliances and service in general, and the cultivation of sociability among its members. Meetings are to be held on the fourth Wednesday in March, May, July and October. It is not improbable that the organization will establish a museum of railway appliances, etc., in connection with its work.

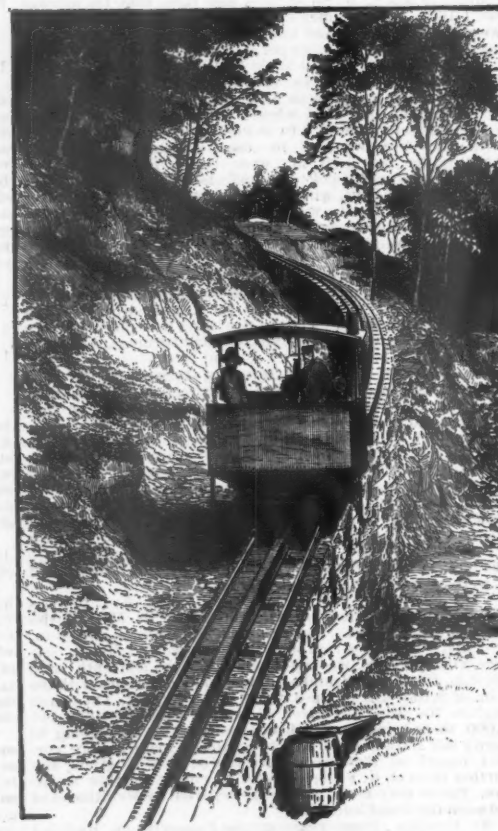
The Mount Pilatus Railway.

The following account of a new and valuable modification of the rack-rail principle is taken from the *Engineer*. The line in question climbs the precipitous sides of one of the best known of the Swiss mountains, Mount Pilatus, and is in the same district as Lucerne and the various rack railroads on the Righi.

The importance of rack-rails caused the promoters of the latest mountain railway on the Pilatus, now in course of construction, Messrs. Locker & Co., in Zurich, to make care-

ful experiments as to the safety and durability of this system of rail, on a gradient of 2,534 ft. per mile, or 48 per cent., the maximum incline of the Pilatus Railway. The results of these experiments, carried out at the Swiss Locomotive Works, and the description of the new system adopted, were recently the subject of a paper read by Mr. J. Weber, Manager of the Swiss Locomotive Works, before the Technical Society of Winterthur. The experiments showed clearly that the component parts of the two forces acting on the rail, viz., the weight of the engine and the force resulting from the incline, were not enough to keep the spur wheel in gear, and the engine was lifted out of it. Further trials confirmed this observation so strongly that the idea of a railway up Mount Pilatus was abandoned.

Messrs. Locker and Co. studied the matter further, and brought out an entirely new system, which, by reference to the accompanying drawings, is easy to understand. The essential novelty is the double horizontal rack, in which two



MOUNT PILATUS RACK RAILROAD.

horizontal spur wheels under the engine gear at the same time. The permanent way is also entirely different from any yet in existence. It is throughout the whole length constructed in masonry, the sleepers, consisting of channel iron, are bolted rigidly down with the masonry. The distance of the sleepers is 1,310 metres (51,575 in.) from centre to centre. Where the rack and the rails are jointed there are two sleepers in a distance of 890 millimetres (14,961 in.). The rails—gauge, 800 millimetres (31.5 in.)—are bolted down to the sleepers; the central chairs, consisting of angle and channel iron, are riveted to the sleepers. The longitudinal Vautherin rail is bolted to the chairs, and last, the actual double rack is bolted firmly to the Vautherin rail. The rack is cut out of a solid steel bar, and each separate piece is only three metres (9.84 ft.) long; so that the expansion by heat amounts only to 2 millimetres (.0787 in.) and has no influence on the system. The horizontal curves have all a radius of 80 metres (262 ft.), or nearly 22 deg., the vertical ones, at changes of grade, 500 metres, 1,640 ft.

The engine, designed and built at the Swiss Locomotive Works, Winterthur, is entirely different from any type yet existing, engine and carriage forming one vehicle, the frame of both being in one piece. The boiler, of ordinary locomotive type, is placed across the rails; thus the heavy incline has hardly any influence on the level of the water. The machine is exceedingly light, weighing empty, 6 $\frac{1}{2}$ tons; in

working order, and loaded with thirty-four passengers, 10.5 tons. The principal dimensions are:

	Sq. metres.	Sq. ft.
Heating surface.....	20	215
Grate area.....	375	4
Water capacity of boiler.....	700 litres.	185 gallons.
" " " tank.....	800	211 "
Coal capacity.....	130 kilos.	292 lbs.
Ratio of velocity between engine and spur wheels.....	3 8	
Effective horse-power.....	67	
Spur wheels gearing into rack, dia.....	405 mm.	15.95 in.
" " " pitch.....	80 "	3.15 "
" " " distance apart.....	5,650 metres.	18 ft. 6 $\frac{1}{4}$ in.
Wheels running on rails, dia.....	400 mm.	15.748 in.
" " " wheel base.....	6,100 metres.	20 ft. 2 in.

The speed of the engine, up and downward, is 2 $\frac{1}{4}$ miles an hour. Special attention has been paid to the brakes. There are—(1) The engine brake, manipulated by the stoker; (2) the worm wheel brake, acted by the guard; (3), the automatic mechanical brake, which comes in action as soon as the speed exceeds 2 $\frac{1}{4}$ miles per hour. As a precaution against wind pressure, there are four shoes acting sideways against the rails.

The first engine has already, and will, during the whole time required for building the line, serve for transporting the material, as even most of the stones required have to be brought across the lake, those on the Pilatus being entirely unfit for the purpose. There will be every opportunity of testing engine and line before English tourists are able to mount the wild Pilatus by rail. The technical society of Winterthur visited last month the line already constructed—at present a length of 500 metres. Although at first a slight feeling of trepidation was caused by the heavy incline, after examining the work and engine, which both were explained by Mr. Locker and Mr. J. Weber, the manager of the Swiss Locomotive Works, no hesitation was felt in mounting the engine, and the visitors were transported up and down again. The total length of the line will be about 2 $\frac{1}{4}$ miles, and it is expected that the work will be completed by the season of 1888. We are indebted to Mr. C. D. Ziegler, Schützenstrasse-Winterthur, for preceding information.

Contributions.

Railroads in Ecuador.

NEW YORK, Jan. 29, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to your editorial notice in the last number of the *Railroad Gazette* relating to the railroads of Ecuador, permit me to call your attention to page 380 of our "Poor's Directory of Railway Officials and Railway Directors," upon which you will find information in regard to one (and the only) railroad in Ecuador. That line, though insignificant and unprofitable, is nevertheless, a railroad of 40 miles in length, and in the interest of accuracy I take the liberty of correcting the statement you made, that "up to the present time not a single mile of track has been built in that state."

JNO. P. MEANY, Asst. Ed.

The Coupler Question.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the consideration of this question, will you permit me to offer one or two suggestions? I do not claim the right to do more, being neither a "Master Car-Builder" nor a "Master Mechanic."

It has been a noticeable feature in the discussion of this subject, that couplers best adapted for coupling with the old drawheads as now in general use, have been most favorably considered. A coupler that operates most satisfactorily, not with a coupler of its own kind, but with the many kinds of drawheads now in use, has apparently been the coupler which the railroads have taken the greatest interest in. This, I think, is mistaken policy, for the reason that no coupler has yet been invented, nor is it possible to invent one, which will operate perfectly with the diverse drawheads now in use. It is conceded that with conditions favorable and with the necessary preliminary adjustment of pins, and with guiding, etc., that there are couplers which will couple with the present drawheads, without requiring the trainman's presence between the cars, at the moment when the coupling takes place. But that is not "automatic coupling."

An automatic coupler is one which, under all circumstances and under all conditions, without preliminary adjustment of pins or links, and without guiding (and I should say without setting), will always couple. It goes without saying that no coupler has been invented which does all this when operated against old-fashioned drawheads.

I offer the suggestion that any delay in coming to a conclu-

sion on the coupler question, in the expectation that such a coupler may yet be devised, is a waste of time.

Conceded that there are couplers which operate more satisfactorily with the old drawhead than others, such couplers are not to be preferred to the others, unless they are also superior when coupling with a coupler of its own kind. While coupling with the old drawhead more perfectly than others, they may be inferior when coupling with couplers of their own kind. With the adoption of such a coupler, a present difficulty is bridged over, which can but entail in the near future a re-opening of the entire question, entailing other changes, and ultimately increased loss. Neither the companies nor the public will be satisfied with a device when there are many superior devices.

The coupler which will operate most perfectly when used with a coupler of its own kind is the one to adopt wholly without regard to its action with the drawheads now in general use. I believe, therefore, that it is not wisdom to experiment with the action of couplers in connection with the old drawheads; that the sooner we get rid of the present drawheads and put them entirely out of consideration as a factor in the discussion of this question, so much the sooner will the whole question be brought to a decision.

These suggestions, I think, are pertinent in view of the fact that many of the tests thus far held have been to show not so much the operation of a coupler with a coupler of its own kind, as to show its operation with the old drawhead, or with some one species of the old drawhead.

Such tests, so far as they have been so confined, have added nothing to the main question, nor have they assisted a decision of the question. They have been instead a positive detriment.

Railroad companies naturally seek to retain the use of their old drawbars, until worn out; and so long as that desire lasts, the temptation to favor devices which shall ultimately prove inferior will exist, with the danger of adopting such a device.

Future tests should therefore be confined to the operations of couplers with couplers of their own kind; to reach the most desirable coupler, with a long look ahead, when it shall be the only coupler in use. This will greatly simplify the whole subject, and aid in reaching definite results. But so long as the companies seek a coupler which is best to couple with every device known, or unknown, they will get no nearer to a decision, because they will be seeking something which can never be perfected to their satisfaction.

When, in the course of time, the companies shall reach a decision to examine couplers solely with a view to the selection of a coupler which operates the best with a coupler of its own kind, limited action may be taken, under agreements, with binding obligations, to adopt the report of some properly constituted committee.

I do not, therefore, agree with the conclusion reached by the Railroad Commissioners of New York, that the only solution of the question is to compel the roads to adopt a coupler recommended by a commission appointed by Congress.

A committee should be selected from those who have arisen from the ranks of the trainmen to higher positions; men who had a practical experience in the handling of couplers, and not from men who are simply car-builders and mechanics. Brakemen who have become Superintendents (there are many of them) would make most desirable committee-men; and those now brakemen who may have operated the different couplers should be called in, and without discussion express their preference by ballot, as a valuable aid to any committee.

When the subject shall be divested of that which seems to me the insane idea, that a coupler can be made to operate perfectly with all the various devices for coupling, and the roads come to the conclusion that it will be profitable to cast off their drawheads in a lump, the question may speedily be decided without national interference, which at least would prove unsatisfactory.

JUDEX

McKeen Coupler.

EASTON, Pa., Feb. 1, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your notice of the last meeting of the Master Car-Builders' Club, you report me as saying that Mr. Goodwin had consented to make a test between the McKeen coupler and any hook coupler. This is a mistake. Mr. Goodwin had consented to make a test between the link and hook couplers, if the proper arrangements could be made, and the necessary appliances could be obtained, and to make it an inducement for the owners of some hook coupler to enter the contest the McKeen Coupler Co. would probably put up a sum of money the hook coupler people to do the same, and the money of the loser in the trial should be paid to St. Luke's Hospital.

I notice in your editorial on "Slack and Elastic Couplings" you say that in a train fitted with the ordinary drawbars, blocks of iron can be put in, and thus make it a close coupled train. In one sense it is, but it is not a train of "hook couplers," which are rigid in their lateral action, and when a train is on a curve, the flanges of the wheels will be crowded against the rail on the inside of the curve and make it start and pull much harder than it will with the loose link, which allows each car to play laterally between the rails, and is much more yielding in its action.

I would also like to ask why the "link couplers should not be provided with the same kind of springs you propose for the hook couplers." I am sure the cars would be no farther apart when the train stretched up than they would with the blocks, as the difference in length required from the dead blocks to give them room to couple would be more than the $2\frac{1}{2}$ in. necessary for the link.

It has also been asserted that the hook couplers are stronger, and that the link couplers have not been strengthened in proportion to the size and weight of the cars as now

built. This may be a fact as to cast iron draw bars, but the hook coupler cannot be made of cast iron at all, and if malleable or annealed cast steel is used, the link coupler can be made even stronger than the hooks, as there is no hinged part to get out of order and break.

I have been told by an engineer of machinery on one of our leading railroads that they have in use 4,200 malleable drawbars and not one has broken. The Union Tank Line Co. have a large number of malleable drawbars in use, and none have broken as yet, and I am sure no hook coupler can compare in strength and wear and tear with the wrought-iron drawbar used on the Pennsylvania Railroad.

In the article on the Burlington experiments on slack it is said that the engine managed to move 38 cars (with the iron wedges in the links), with some difficulty without fear of stalling, and that the same number of cars with loose couplings were hauled with somewhat greater ease; but it does not appear that they tried to start more cars, and yet it is said that it shows conclusively that an engine can start as many cars with tight as with slack couplings. I think this is a mistake, especially when hook couplers are used, and on such curves and grades as are found on the Delaware, Lackawanna & Western and the Lehigh Valley. If a test is made with both, subject to the same conditions, I feel confident as to the result, and as the saving of the lives and limbs of the trainmen is of more importance than any discussions as to which is the best coupler or best type of coupler, the sooner the matter is thoroughly tested and settled, so that the railroad companies can take hold of it with intelligence and unanimity (whichever type may win), the better it will be for all concerned.

T. L. McKEEN.

[Most of the points raised in Mr. McKeen's letter are matters of opinion, which can only be settled by a practical test, which would, however, command more attention if conducted by a well-known officer of a large railroad, than if managed as a private affair by the patentees of different car couplers.

Mr. McKeen appears to be under the impression that a train fitted with vertical plane or hook couplers will not pass readily round a curve. As many thousands of passenger cars fitted with vertical plane couplers pass daily round some very severe curves, we fail to understand Mr. McKeen's reasoning. A dining or sleeping car is nearly twice as long as an ordinary freight car, and therefore requires a greater angular movement at the couplers to pass round a given curve. A freight car with a vertical plane coupler should therefore traverse a curve with greater ease than a passenger car.

A train fitted with blocks to take up most of the slack in loose link couplers should also pass freely round a curve. It was expressly pointed out in these columns that some slack must be left between the drawheads.

If Mr. McKeen or any of our readers will refer to our account of the Burlington trials as to the relative starting power of an engine with trains of loose and tight coupled cars, they will see that the difficulty was not in starting the cars, but in keeping them going when apparently fairly started.* It is thus evident that the method of coupling had no effect on the load the engine could haul. No less than 50 cars could be started, but only 38 could be hauled for any distance.

There is no insuperable objection to link couplers being provided with the powerful and long-range draft and buffing springs essential to the proper working of vertical plane couplers, but it remains to be proved whether such springs will give results commensurate with their cost, or indeed improve the working of slack couplers. Possibly Mr. McKeen will arrange for a practical test on this point.—EDITOR RAILROAD GAZETTE.]

The Norris Locomotive, 1836, the First to Ascend a Heavy Grade.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the great progress made in engineering and mechanics during the past fifty years, few go back in retrospect to that period when steep grades were deemed impossible to be ascended by locomotive power. Stationary engines, working ropes or chains, were then the only practicable means by which inclines could be worked, and it was not until the practical demonstration made by a locomotive, a pigny in comparison with the huge "Iron Horses" of to-day, that engineers could be induced to believe that grades were no longer to be an obstacle to locomotive power.

The following account of the ascent of the inclined plane on the old Philadelphia & Columbia Railroad by the locomotive "George Washington," will relate how this important fact of engineering science was first demonstrated to the world, while a brief history of the Columbia Railroad will doubtless be interesting to many readers.

The discussion concerning the building of the Erie Canal brought prominently before the public the great importance of constructing a highway between the eastern portion of Pennsylvania and Pittsburgh and the Ohio Valley, by which freight could be transported at less expense than by hauling in wagons. The Legislature in 1823 granted a charter to the Pennsylvania Railroad Company, authorizing the building of a horse railroad from Philadelphia to the town of Columbia on the Susquehanna River in Lancaster County. At the

* See Railroad Gazette Jan. 28, 1887, page 62; and Aug. 13, 1886, page 580.

latter point it was intended to connect with the canal at Hollidaysburg, a distance of 172 miles, then crossing the mountains to Johnstown, to proceed to Pittsburgh by canal. This latter section comprised the old Allegheny Portage Railroad. There was a strong feeling in favor of canals, and sufficient stock not being taken, the project failed, and in 1825 the Legislature repealed the act.

Notwithstanding this failure, public attention was directed to the importance of railroads as compared with canals, and on March 24, 1828, the Legislature passed an act providing for the construction by the state of the Philadelphia & Columbia Railroad. Major John Wilson, formerly an officer in the army engineer corps and Civil and Military Engineer of South Carolina, began the work of locating the line with a corps of twelve men in the following month. Retarded by the failure of the Legislature to provide the necessary funds, the construction proceeded slowly and was not completed until April 16, 1834, when the road was formally opened. The Governor and State officials were present at the opening, traveling to Columbia on a canal-boat. The road extended from the corner of Broad and Vine streets to Callowhill street, then turning to the northwest passed through "Pratt's Garden" to the Schuylkill, which was crossed on a wooden bridge below Peter's Island. The line thence passed through the valley of Chester County to Downingtown and Coatesville, terminating at the basin of the Pennsylvania Canal in Columbia. There were no locomotives on the road, while any one could haul merchandise over it by furnishing the wagons and horses to draw them and paying a toll to the State. This was the beginning of the great Pennsylvania Railroad, the model road of the world.

Among those who, by thought and practical experiment, paid much attention to the construction of the locomotive, was Colonel Stephen H. Long, of the United States Topographical Engineers, who in 1830 received letters patent for certain improvements in the construction of locomotives and other steam engines. In March, 1831, a company consisting of Colonel Long, General Parker, G. D. Wetherell, Dr. Richard Harlan, and William Norris, was formed in Philadelphia under the title of the "American Steam Carriage Company" to build "Locomotors," as they were called at that time, after the designs of the Colonel, assisted by Wm. Norris. These engines, among other qualities, were intended to burn anthracite coal. The first engine, designed much like the best English build, though having several original points, was built under the immediate superintendence of the Colonel at the Phoenix Foundry, Kensington, and weighed about $3\frac{1}{2}$ tons. On July 4, 1832, it was placed on the Newcastle & Frenchtown Railroad, and steam raised amid the hopes and anxieties of the builders. But on trial it was demonstrated to be unsuccessful in consequence of the limited grate and fire surface. The machine would run a mile at fair speed, but would then come to a stand until a fresh supply of steam was generated. The following day, however, the engine drew two large cars containing some 80 persons with ease, and with no failure of steaming capacity; it was then run on the road for some time, until finally removed by the builders.

After this practical experiment in grate surface, the locomotive "Black Hawk" was built and put on the Columbia Railroad for trial, and performed with much success on that line, as well as on the Germantown Railroad. This engine was never in want of steam, while its performances were regular and always on time.

At this period all the first associates, except Mr. Norris, had withdrawn their several interests, leaving Long and Norris to continue the manufacture on their own account. They accordingly, in the year 1834, built three locomotives, anthracite burners, for a Boston railroad. Though the performances of these engines were as good as those of other manufacturers of that day, they were condemned solely because a coal fire required more and better attention than a wood fire, a most absurd reason for such action on the part of the company. The engines were afterward used on the sand and gravel trains at a most economical rate.

In 1834, Colonel Long, called away by his public duties, disposed of his interest in the manufacture of locomotives to Mr. Norris, who thus became sole owner, and profiting by the hard earned experience gained in previous efforts, after much labor finished and put into operation on the Germantown Railroad in May, 1834, the locomotive "Star." This machine, the product of Mr. Norris' great mechanical abilities, was a most thoroughly successful engine, and at once opened the way to the great success he afterward attained, for as Long had failed to construct satisfactory machinery, William Norris under the most discouraging circumstances by his determined effort firmly established the widespread high reputation the Norris works so long enjoyed. In the last mentioned year, Mr. Norris determined to open a shop of his own, and putting his resolution into effect, obtained possession of an old stable formerly owned by Colonel Hamilton, situated on what was then called Bush Hill. In this shop, the nucleus of the afterwards very extensive works, he commenced operations with six workmen whose united wages were \$36 per week. The power was furnished from the adjoining wheelwright's shop of Messrs. Rush & Michlenburgh by a connecting shaft through an aperture in the wall.

At that period railroads were considered by many hardly more than an exciting fiction, while even the practicability of steam locomotion was not generally admitted, and there were many, indeed, who denied its possibility. The mechanical skill then prevailing was imperfect at the best. There were no large bodies of men at command having thorough and distinct training in the various branches of locomotive building. Little was known of the construction and use of the modern tools, and even the "turning engine" was a rude and primitive affair; while other machines now common in

mechanical establishments were wholly unknown. A letter from a manufacturer of that date will illustrate the embarrassing condition of affairs in that particular: "Our career, although short, has embraced the infancy and youth of mechanical operations in this country. When we commenced, in 1828, there was not a planing machine known; screw cutting and drill presses, and shaping machines by power were scarcely thought of. Slide-rests were sometimes used, but turning was generally done with the long handled 'button head' and 'hook tools,' and the finishing was done by the hand hammer and chisel. Steam joints were made with a lead ring on a rough surface, and packed with rusted iron borings." Under such circumstances many of the great establishments now holding deservedly high rank for the extent and quality of their productions were commenced.

The locomotive builder of that day had thus not only to contend with the popular unbelief in the success of his efforts, but had also to procure and teach suitable workmen, of which there were very few, for the execution of his designs—indeed, nothing short of the practical talent competent to the perfection of the locomotive could have supplied the machinery and fixtures necessary for its construction. This quality William Norris possessed to the highest degree, enabling him to achieve the most decided success. From the day of its establishment the career of the Norris Locomotive Works was onward. Each month added increased facilities to its internal arrangements, and each year to its extent of territory.

In 1834-35, the manufacture being well under way, Mr. Norris determined to secure and maintain an "Excelsior" reputation for his engines, and in 1836 produced a locomotive—the "George Washington"—that caused another "Rocket" excitement. This engine was built on the order of the state of Pennsylvania for the Philadelphia & Columbia Railroad, and was placed on that road July 9, 1836. The following morning its power was severely tested in ascending the inclined plane near Philadelphia. This plane was 2,800 ft. in length, with an ascent in that distance of 196 ft., or at the rate of 369 ft. to the mile, or 7 per cent., or 1 in 14.3. The engine weighed 14,930 lbs. with water only, while the load attached weighed 19,200 lbs., including 24 persons who were on the tender and burden car. The engine started immediately at the base, without a running start, and dragged up the above load in 2 min. 1 sec., or at the rate of 15½ miles per hour, pressure on the boiler a fraction under 60 lbs. per square inch. The engine then descended the plane with the same load at various speeds, frequently stopping to test the security of the valves being reversed, or set for going ahead, and when it was desired to stop altogether, the steam was let on very slow, which brought it to a dead stand for a second or two, when it would immediately start up the grade. In this way stopping and starting at pleasure, the time occupied in descending the 2,800 ft. was from 12 to 15 minutes, thus testing the perfect security of the engine's performance on the plane, the first ascent of a heavy grade made by a locomotive. The engine again ascended the plane with the same load and took its place on the road the same morning, ready for use.

The startling announcement of the signal success of this engine and the consequent revolution in engineering science was generally discredited, and to convince unbelievers of this great triumph of skill and mechanics, a second ascent was made on July 19. By special invitation of Mr. Norris, a large party of railroad officials, engineers and scientific gentlemen were present. Arriving at the foot of the plane while the rails were yet wet with the morning dew—a most unfavorable condition for testing locomotives on heavy grades—it was found that by accident or design the fire was burning while the water had been nearly blown out of the boiler, endangering the flues and causing a leakage to some extent. On proceeding a short distance the drivers slipped to such an extent that sand was applied to the rails, which were found to have been oiled, having been done by envious persons in the company's service, who, having lost by the previous very successful performances of the engine, adopted this method of showing their hostility to the good working of the machine. Notwithstanding this delay, the engine easily drew up the grade in 2 min. 24 sec., the large load of two large passenger cars containing 53 persons, beside the tender loaded with coal and water, the whole weighing 16 tons, and gaining speed and power to the top, which was reached with steam blowing off from the safety valve. Thus again was the power of the machine tested to the most complete satisfaction of those present, who signed a testimonial, which was afterward presented to Mr. Norris, expressing a perfect unanimity of opinion regarding the great success of the trial and of the superiority of his locomotives.

The party proceeded to Lancaster, returning in the afternoon, the distance to the top of the grade being 67 miles, which distance was run in three hours up 47 ft. grades and through curves of 600 ft. radius.

On a level the high speed of 47 miles per hour was easily attained. Among those present were O. A. Norris, (afterwards a member of the firm of Norris Brothers, by whom the works were conducted upon the retirement of William Norris), Franklin Peale, Joseph Harrison, Jr., H. R. Campbell, J. P. Morris, and many others then well known as mechanics and scientific men.

Nothing approaching these results had been attained before. The greatest power exerted in England was to ascend a grade of 1 in 60, and in America of 1 in 20. The possibility of such a performance was strongly denied by English mechanical papers, but I hope to show in a future letter that the facts given above are fully borne out by letters and certified statements of those present at the test.

The locomotive "George Washington" was a six-wheeled machine having but one pair of 48-in. drivers placed in front

of the fire-box and a four-wheeled, centre-bearing truck, with 30-in. wheels. There were 78 copper tubes 2 in. outside diameter, 8 ft. long, cylinders 10½ in. x 19 in., bolted to the frames and a stout bed-plate forming the sides and bottom of the smoke-box, and placed outside of the frames and gearing. This was first done at the Norris Locomotive Works, and was the leading feature of their engines. Most of the other builders, until 1840-42, used the "half crank" or "full crank" connection, upon neither of which plans could the same capacity of engine or the same compactness and simplicity of construction be obtained as with the outside connection.

The valuable principle of the distribution of the weight of the engine was recognized at a very early day at those works which were among the very first to build the present eight-wheeled "American locomotive" as well as six-wheeled connected engines, while they were the first to use expansion braces, and also built the first ten-wheeled engine ever built. The frames were of solid wrought-iron with pedestals and braces all made in one piece of forging, other builders using wood covered with iron plating.

Sand boxes and head-lights were not then used, while cabs were not employed until 1845 or 1846. The pilot also was not used until several years later. The connecting-rods, guides, rock shafts and all the running gear were of the best forged iron, while the pumps were of cast-iron with copper feed and section pipes.

The boiler and fire-box were of made ½ in. iron plates, the fire-box being of the Bury type, as used in England, but much improved upon by William Norris, made wider and larger.

The valve-gear was the old "hook motion," so well known to those who worked locomotives half a century ago, that it is unnecessary to describe it here. The valves worked full stroke, although by the separate "cut-off valve" soon afterward employed on engines built by Mr. Norris, the steam was used expansively cutting off at one-fourth of the stroke. The "hooks" had steel dies set in to prevent wear, which had been the cause of complaint in the English engines on the road, and built by Stephenson at Newcastle.

A plain straight smoke-stack with wire netting at the top was generally used, although some were afterward built of the form resembling the "Yankee" pipe so much used at one time.

The tender was on four 30-in. cast-iron wheels which were of spoke form, the axles passing through pedestals. The tank had a capacity of 500 gallons of water, while there was about space for one cord of wood, which was the fuel usually employed.

The driving wheels were of cast iron with wrought-iron tires 2 in. thick shrunk on the centres. The crank pins were of wrought iron of about two inches in diameter.

Much discussion prevailed at the time among locomotive builders, as to the relative merits of placing the driving wheels in front or behind the fire-box. Mr. Norris, however, conclusively demonstrated the great superiority of the former method in the then unequalled performances of his engines on the Columbia Railroad. With the drivers in front of the fire-box it will be readily seen how the greatly increased adhesion operated to the best advantage of the engine. The assertion has been made that this plan of construction caused the engines so built to prove destructive to the rails. The writer has been frequently informed by those employed on the road at the time, that such was the distribution of weight in these engines, that no greater wear on the rails resulted than that produced by engines with drivers back of the fire-box. It was, however, reserved to the late H. R. Campbell to originate and patent the plan of engine now so universally known as the "American" plan, four drivers and a swing truck, superseding the single driver engines, and which for the past fifty years has been the standard passenger engine of America. An engine on this plan was first built by Wm. Norris for the Guanabacoa R. R. of Cuba in 1840.

Thus the "ascent of heavy grades" having been successfully demonstrated to be entirely practicable by the mechanical skill and enterprise of William Norris, to whom the highest credit is due in solving that, at the time, important problem. We may compare the present with the past, while, if such results have been accomplished, may we not look for still grander ones in the future? In conclusion, it is a source of pleasure to the writer to be able to present to the readers of the *Railroad Gazette* an accurate drawing of the Norris engine of 1836, and he also would express his obligations to Mr. George Peterman, employed on the "Plane" at the time, but now in the service of the Pennsylvania Railroad, for the valuable aid given him in the preparation of this article. If it shall have accomplished the aim of the writer to give an accurate account of the events of fifty years ago, his efforts will not have been in vain.

HENRY L. NORRIS, JR.

Hand Baggage.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice that in your article on "A German View of American Railroads," you note Herr Leisner's complaint that no adequate provision is made for carrying hand baggage in American railroad cars. In Europe, a roomy shelf is provided above each seat, and it will safely carry a good heavy valise or satchel. Hand baggage can thus be placed out of the way in a clean place. In America, it must either be placed on the seat alongside you, or dumped on the floor. In the former position it not only takes up room that might be occupied by another passenger, but is, even on the smoothest roads, liable to be jerked off on the floor when the train is swinging over a curve or when the brakes are sharply applied. Personally I don't chew tobacco, and do not wish that my neat grip should receive a legacy from a former passenger who does. Even, however, if the floor of the car is clean, it

is very unpleasant to have your feet cramped in one position by hand baggage on the floor. The back of the seat in front is bad enough on a long journey.

You state that larger baggage nets could be provided in American cars, and that this is not done because companies here endeavor to prevent the carrying of hand baggage. May I ask the reason of this objection? If I were a railroad manager, I should be only too happy if all travelers could dispense with trunks and carry all their belongings, and so save me the trouble and expense of handling the enormous trucks now used.

I was certainly under the impression that the boot was on the other leg, as I have frequently found that railroads here decline to check stout articles of hand baggage that have been accepted without a murmur and conveyed without damage on European railroads. When a train is full, I should often wish to check my substantial grip, but I am obliged to tote it myself and endeavor to find room for it and a large pair of feet in a space barely sufficient for the latter articles. If you can induce railroads to look into the question you will confer a favor on a representative of a large class.

A DRUMMER.

New York Railroads in 1886.

The fourth annual report of the New York Board of Railroad Commissioners (of which we published a short notice three weeks ago), gives the following summary of results for the year.

	1886.	1885.
Gross earnings from operation of road	\$125,160,289	\$111,132,961
Operating expenses	79,260,798	71,175,826
Net earnings from operation of road	45,899,491	34,457,135
Income from other sources than operation of road	4,440,391	6,244,898
*Interest paid and accrued	25,673,372	24,644,451
Taxes	4,045,676	4,874,334
*Dividends declared	11,178,176	10,453,865
Surplus	4,658,191	3,502,337
Stock and debt	1,224,777,611	1,292,393,622
*Cost of road and equipment	1,138,370,470	1,175,948,966
Percentage of gross income to cost of road and equipment	04.42	03.46
Percentage of net income to capital stock	02.60	01.59
Percentage of dividends declared to capital stock	01.63	01.00
Miles of road built in New York State	7,342.19	7,311.40
Tons of freight carried one mile	10,640,849,655	9,902,683,295
Increase in 1886 of 07.46 per cent.		
Average freight earnings per ton per mile (cents)	0.78	0.73
Average freight expenses per ton per mile	0.49	0.52
Average freight profit per ton per mile	0.39	0.21
*Passengers carried one mile (exclusive of elevated road)	1,830,734,634	1,834,580,425
Decrease in 1886 of 00.21 per cent.		
Average passenger earnings per passenger per mile (cents)	2.3	2.1
Average passenger expenses per passenger per mile (cents)	1.4	1.3
Average passenger profit per passenger per mile (cents)	0.9	0.7

* Includes respectively interest and dividends paid by lessors from rentals received from lessees as follows:

	1886.	1885.
Interest	\$6,854,278	\$5,031,900
Dividends	3,481,812	3,427,453

+ These items are materially reduced in 1886, in consequence of the reorganization of the West Shore R. R. Co., by which its stock and debt was reduced from \$125,924,839.75 in 1885, to \$60,000,000 in 1886, and its cost of road and equipment from \$101,552,487.82 in 1885, to \$60,000,000 in 1886.

* This item would be somewhat larger in 1886 than in 1885, were it not that one company has failed to file its report this year.

The gain of the railroads is but slight in comparison with the increased traffic by canal.

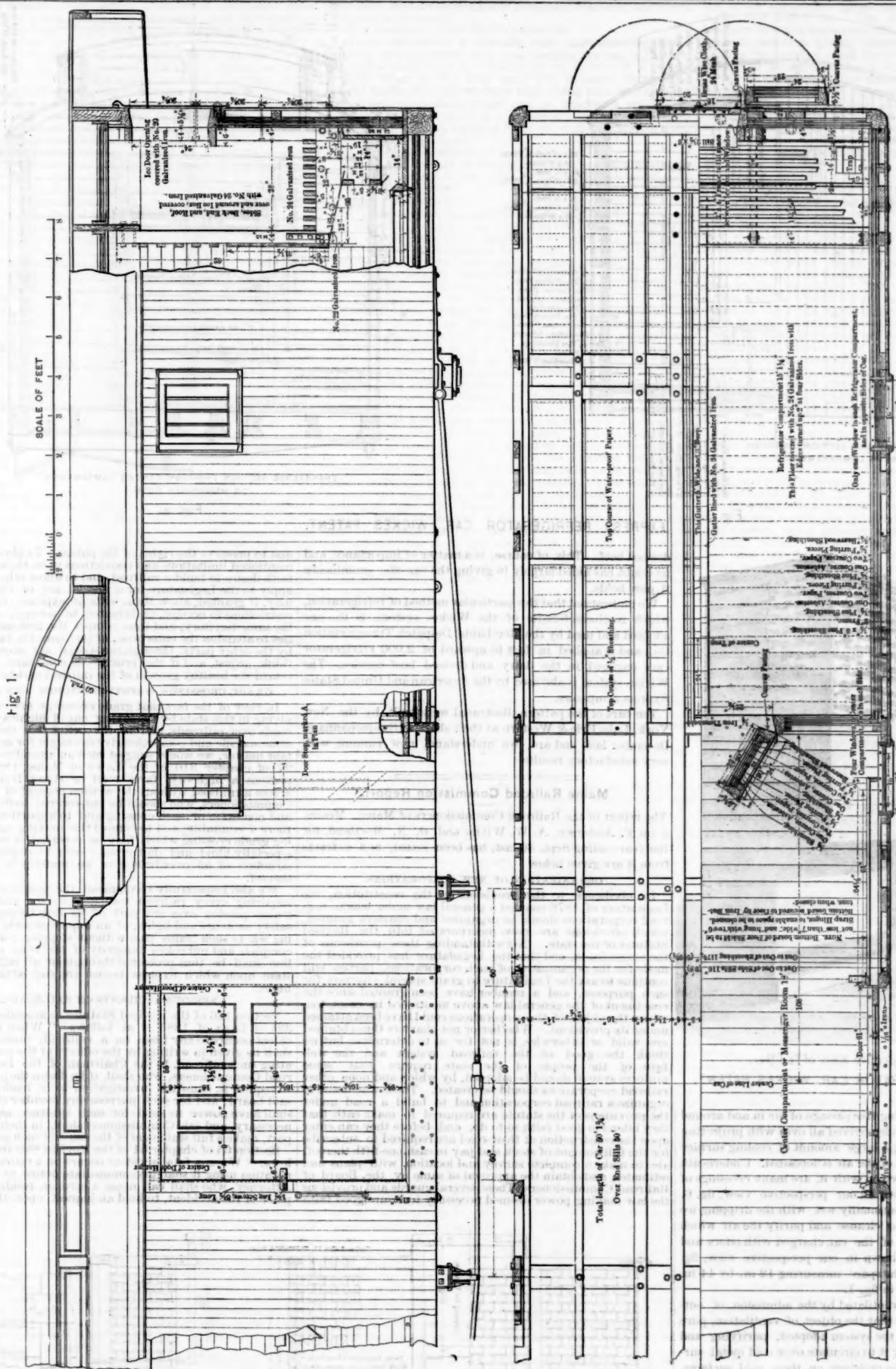
The trunk lines have carried but 152,297 tons of through freight during the season of navigation in excess of that carried last year, but the increased rates have made it profitable. The canals, however, have carried 5,293,982 tons as compared with 4,731,784 tons in 1885. No comment is made upon traffic operations (aside from those of the Elevated R. R.) beyond the bare statement that the lease of the West Shore by the New York Central did not produce the complaints which some persons apprehended.

The record of accidents may be summarized as follows:

	1886.		1885.	
	Killed.	Injured.	Killed.	Injured.
Causes beyond their own control:				
Passengers	19	52	0	32
Employees	25	149	43	174
Others	8	12	3	6
Total	52	213	43	212
By their own misconduct or inattention:				
Passengers	9	31	0	52
Employees	69	397	50	214
Others	262	197	228	219
Total	340	555	287	485
Caused by intoxication:				
Passengers	0	4	3	5
Employees	2	1	2	1
Others	32	28	23	33
Total	34	33	28	39
Indeterminate as to want of caution:				
Passengers	2	8	1	10
Employees	63	311	42	383
Others	13	18	7	8
Total	77	337	50	400
Grand total	503	1,138	411	1,136

This shows an increase of 92 killed and 2 injured, as compared with the previous year. It is, however, noted that the increase was not due to defective construction, rules or discipline, but to "unpreventable" causes, misconduct or carelessness on the part of those killed.

Half of the passengers killed lost their lives in the Silver



EXPRESS REFRIGERATOR CAR, WICKES PATENT—NEW YORK, LAKE ERIE & WESTERN RAILROAD.

Creek disaster. Aside from that the leading causes of death or injury were as follows:

CAUSE OF ACCIDENT.	1886.		1885.	
	Killed.	Injured.	Killed.	Injured.
Fell from train, engine or cars...	41	108	48	104
Getting on or off trains in motion	49	144	30	140
Coupling or uncoupling cars.....	24	367	15	375
Walking or being on track.....	24	171	226	156
Crossing track at highways.....				
Protected with gates or flagmen.....	7	23	8	17
Not protected with gates or flagmen.....	21	21	24	36

The Board reports a general improvement in the physical condition of road; complains of defective methods of car heating and ventilation; repeats its suggestion for guard rails on box cars; reprints its account of coupler tests (already fully reported in the *Railroad Gazette*); and promises a supplementary report on bridge strains.

The legislation recommended is substantially the same as in the report for 1885. Special attention is drawn to the evils attendant upon over-issue of stock and bonds; also to those which arise from the leasing of parallel lines without proper provisions for the approval of the stockholders.

Express Refrigerator Cars, Wickes Patent.

The accompanying engravings represent some express refrigerator cars recently built by the Erie to run on fast passenger trains. A brief notice of these cars has already appeared in these columns, and it will be noticed that the car has passenger trucks, Miller platform, etc., and as regards running gear, is in all respects equal to passenger train equipment.

The interior of the car is divided into three separate compartments of nearly equal size. The two end compartments are fitted as refrigerators for cold storage, and the centre compartment is fitted with a stove and is intended for the express messenger. Doors open out of this centre compartment into each of the end compartments, which have no side doors.

Each refrigerator compartment has an ice-box placed at one end and filled by a small door in the end of this car. The arrangement is clearly shown in the side elevation and plan of the car, figs. 1 and 2. These end ice doors are replaced by doors with wire gauze when it is desirable to use the car at certain seasons of the year with ventilation and without ice.

The main principles of the Wickes system of refrigerator car may be summarized in two words:

Non-conduction is secured by dead air spaces in the walls of the car.

The maximum of refrigeration is secured with the minimum quantity of ice by utilizing the cooling power of the water dripping from the ice. This water also purifies the air, by absorbing any gases or odors given off by the milk, meat, game, fish, or other substances in the car.

The methods by which the first object is obtained are clearly shown in our illustrations. The walls are made as nearly as possible perfectly non-conducting, by means of numerous air spaces and linings, and care is taken to prevent any air leaking in at the joints of the doors.

The ice-box is made of strips of galvanized iron crossed

those whose deaths have been so caused. If the County Attorney does not reside within 10 miles of said place, some justice of the peace, residing in the county, shall be requested to notify a coroner to hold such inquest before notice is given to said Attorney."

It will be seen that these two provisions of statute cover, substantially, the same ground. While a serious accident may not be fatal, certainly a fatal accident is serious, therefore, under these provisions, it is made the duty of two distinct tribunals to make an investigation of the cause of a fatal accident at the same time. True, the object of the investigation is of a twofold nature, but as the same witnesses would be required to appear before both tribunals, perhaps at the same time, it might lead to a conflict of jurisdiction, unless one tribunal should wait till the other had finished its investigation, which would not be a compliance with the provisions of the statute, and would also subject witnesses to much delay and inconvenience. We would, therefore, suggest whether or no it would not be better to provide for one tribunal to investigate all such accidents and to make such a report as the circumstances of the case might require.

INCREASED WEIGHT OF ENGINES.

Before proceeding to give detailed statement of the condition of the several railroads in the state, the Commissioners deem it a duty to utter a few words of warning against the prevailing increase in the weight of locomotive engines, out of all proportion to the superstructure and substructure of most of our railroads.

These railroads were built to carry a comparatively light rolling stock, and now, while from age and hard service, the rails and bridges have impaired power of resistance, they are subjected to steadily increasing loads driven over them at an ever accelerating rate of speed.

We question whether the present general demand for these enormously heavy locomotives with their trains of excessive length, as well as weight, be not a mistake, even upon roads prepared to withstand their impact. It certainly is a most serious error in judgment to permit such immense weights to be impelled over trucks and bridges constructed to carry safely but about half as heavy rolling loads at a much lower rate of speed.

This cannot be in the line of true economy, since all practical men in immediate charge of them admit that rails and bridges, which, under the loads they are designed to carry, would do good service for years to come, are now rapidly failing under the movement of the present heavier trains, and require constant repairs and renewals of parts to maintain them in a passably safe condition, subject all the while to an impending crash of unlimited costs. Even turn-tables, which would be as good as new for turning the engines in common use five or six years ago, are being crushed and ruined by the mere dead weight of those recently put into service. An impression seems to rest in the minds of some railroad officials of the so-called "eminently practical" type, that a bridge will continue safe under these heavier loads for an indefinite period, because it has carried them for a month or a year with no apparent disturbance of its members or material. They argue that all bridges will evidence timely warning of overtaxed condition to proper inspection.

These are paltry thoughts with no reason in them; for it is well known that the life and strength of material—especially iron and steel, when strained beyond certain limits, are actually diminished, it may be almost to the point of rupture, with no visible outward indication of changed structure. We apprehend that there are daily driven, at speed, over railroad bridges, loads greatly in excess of the maximum they were designed to carry securely; each one of these insufficient structures that still remain being held up for a while by drawing upon the factor of safety that was intended merely to provide a margin against imperfect material or workmanship that might steal into its construction, but which is thus encroached upon to a perilous extent. Any day disaster may come; some day it certainly will. Within view of such appalling disasters as have already taken place and must inevitably continue to occur, it is amazing that railroad managers should permit the danger line to be thus approached. But no rational man can doubt that this is often closely done, and to often with even criminal recklessness.

RAILROAD MILEAGE OF THE STATE.

The total mileage operated by companies reporting to the Commission is 6,316 miles. The actual mileage in Maine on Sept. 30, was 1,157.68 miles. At the same date there were under construction 6 new roads, having a total mileage of 48.5 miles. Three of these, with a total of 11.5 miles were very nearly completed, one (18 miles) graded, and two (19 miles) just begun.

Working Single Track Railroads.

We have before referred to a paper by Mr. W. K. Muir on this subject, contributed to the Montreal meeting of the British Association. Below we give some selections from the paper, which apply equally well now as when written, and some comments on it will be found in the editorial columns:

Referring to what may be called the ancient American plan of dispatching, Mr. Muir says:

"I need not refer to the working in this country by time card only; when trains got behind time and irregular, the trainmen flagged their trains along until they saw the opposing train, having then no telegraph arrangements to fall back upon; nor to a more recent period when telegraph arrangements were made by and between conductors to meet and pass their own trains, and latterly between agents and operators, for the conductors, with trains to approach and pass when running behind the time set in their working card, the station agents having so many duties to perform, often carrying telegraphic train arrangement orders in their teeth, to make sure they would not forget them when the train reached the station."

On the making up of a train he says: "Properly equipped trains, and something to run with, and a suitable track to run upon, and trusty men in charge of a train—that would mean for a passenger train, bodies of coaches and windows thoroughly cleaned, outside of axle boxes and running gear scrubbed with a brush and lye solution, and all oil and grease cut off; the running gear, and air brakes known to be reliable, the bell-rope properly strung from the engine cab to the end platform of the rear coach and tested to see that it is O. K.; the cars internally scrupulously clean, cars turned to have the saloons always at rear, water coolers filled with fresh ice water, lamps trimmed, good ventilation, the temperature moderate, a thermometer suspended in the middle of the car to guide in regulating the temperature, the trainmen neat, clean, perfectly sober and in uniform, the baggageman in his car and the conductor (who is responsible for the working of his train, and the tickets or fares and comfort of his passengers) know that everything about his train is right, as regards signals, two red and two white flags, two red and two white and his own lamps, and the tail and side lamps, axe, saw and hammer in each coach, and in his tool box in the baggage car a wrench, waste, oil, wick, detonating signals, dope, the proper signals on front of the locomotive, neither he nor his men smoking on duty, and all alert and attentive to train work and passengers and baggage."

"The trainmen should be seen by the yard-master before they leave, and he should know positively that they are sober, fresh and well rested."

Other portions of Mr. Muir's paper are:

"There should be a working time card showing all the trains in each direction with their meeting and passing places. All trains likely to be run should also be shown: it is better to have them in the time card and to cancel them when freight traffic does not warrant their being run, than to make special arrangements and take risk of trackmen and others not being warned, besides at times it is convenient to have other trains, engines running light or with a caboose take and run upon that time."

He says there should be:

"Steps and ladders on freight cars that are arranged with some decent regard to the safety of the brakemen when complying with the rules."

Another suggestion is:

"On the locomotive a mirror set up on the cab would enable the engineer to see and know the condition of his freight train, whether cars were running all right and in line, or when any of them caught fire; but he should have the ordinary locomotive head lamp in good shape, and I suggest with movable numbers, to slide upon a bar in front of the glass, indicating the number of the train for the guidance of the dispatcher, train, track and stationmen; these should be put on by the engineer before starting. If it is an ordinary time card train, the card will indicate his number; if it is an extra train the train dispatcher will give him his number, and his train will be known by that number on the journey. This head lamp should also have red and green curtains, that, when necessary requires, can be drawn across the face of the lamp at night, indicating caution, or danger, or that the train is upon the side track and quite clear of the main track. The engineer can flash this signal in a moment from the cab of his engine by means of cords led from the lamp. Those signals are made of oiled-colored silk mounted on spring rollers set in cases. The advantage is that the engineer can flash a large danger signal to an approaching train, or by pulling the green curtain indicate to the approaching train whether he is upon the side track and clear of the main track and the switch all right. The engineer carries the black tin plate numbers up inside of the roof of his cab, and these numbers slide upon a movable bar, on the face of the lamp. They do not obscure the light and they shine through the colored curtain, and in daytime the numbers are equally distinct. I think this train number in front is safer for passing trainmen and for stationmen than the number of the locomotive painted on the side of the lamp, or the number displayed upon the caboose at the tail end of freight trains."

"Pyrotechnic signals should be lighted and thrown off trains, when from any cause the trains are not making running time and when followed by other trains, as a signal to following trainmen to be watchful and look out for trains not far ahead."

"There should be a V-shaped case or frame built in the upper part of the telegraph office window with changeable transparent signal figures showing number of train and time it passed, so that men, on following trains approaching and passing from either direction would see just when the preceding train had passed that station."

The description of the American dispatcher and his duties, being the distinctive feature of the paper as regards single track working, we give nearly in full:

The train dispatcher's office is, I think, an institution peculiar to this country. You can readily imagine the kind of telegraph operators necessary for this important and responsible work. They should be cool, quiet, sober, systematic, sharp, intelligent, youngish men, with the very best of memories, quick "sound" operators; that is, operators not working by the needle, or dial, or paper, but by the clicking sound of the instrument, knowing the line of track thoroughly, its condition, curves, grades, location of side-tracks, shape and construction of yards at depots, the kind and the "true inwardness" of trainmen in charge of trains for whom they make telegraphic arrangements and to whom they issue orders; they should also know the condition of the locomotives on the trains, weight of train, and so forth, which experience gives them in time, so that in making their calculation of distance to be run, they can be better apportion the time in arranging a meeting point for some other train.

Their office should be in a quiet, private, central locality, the mileage of the district under their charge should be regulated according to the number of trains and extent of traffic upon it. If a long line, it should be in divisions, each set of dispatchers occupied in working trains only over their own division. Their time on duty should be from six to eight hours, according to the nature of the work; the mental strain is often quite fatiguing.

There must be only one dispatcher giving orders on each division, and he should have a first-class "sound" operator helping him, this operator chosen because he was likely to be the making, in time, of a dispatcher. This operator would write out the orders as he heard the dispatcher sending them, and the dispatcher would see what he was sending. The two need not speak to each other. The dispatcher untrammelled has only his train movement diagram to watch, as the operator from time to time records the reports from stations of the passing of trains, and the dispatcher watching the movements of the various trains, with the key of his instrument in hand, sends the orders he plans and calculates, and sees them recorded by his operator, and watches their acknowledgment by the receiving station and trainmen, and finally and at the proper time gives his O. K. completing the train order. These operators should not come on and go off duty with the dispatcher, but have their time on duty 'lap over' the hours of the relieving dispatchers, thus helping to dovetail, as it were, the work of one dispatcher into that of the other, because orders of one given might not be fully carried out when it was his hour for 'off duty'.

"The dispatchers have a skeleton time-sheet for each day of 24 hours and for each of their divisions, showing the names of stations and side-tracks, with distances; these run down the middle of the sheet, with the columns on each side, showing actual times of each train movement as reported from outside telegraph offices. The dispatchers are thus enabled to watch train movements and calculate and arrange for meeting and passing points when their assistance with the telegraph is needed and can be profitably used."

"When these arrangements are necessary and orders are to be issued, the dispatcher, handling the key of his instrument, calls up the operator at the distant point, who sees that his station order signal is set for stop, and says so; then receives the order sent to the trainmen first affected. The dispatcher's operator, as I have already explained, takes by sound and records in his book the message with date, time, to whom sent, number of train, at what station, signing the superintendent's name, with dispatcher's initials, so that distant operators and trainmen know who sends the message."

"This order is taken down by the receiving station operator in a manifold writer making three or more copies (three at least), one for himself, one for the engineer and one for the conductor affected, repeats the order back to know it is right, but keeps these messages until the trainmen arrive and sign the copy in his book; and only when the men fully understand the order and sign the book copy,

and that is reported back with their signatures, and the train dispatcher gives his O. K., can the order be taken and acted on. The dispatcher in the meantime has been in communication with the station operator in the opposite direction, giving orders to the opposing trainmen, naming the meeting point, the two messages being practically alike, and the train having been held by the 'order-signal,' these two trainmen in like manner sign the station copy and the message, with their signatures repeated back, and the dispatcher's O. K. obtained, the 'order-signal' boards are changed for the time being and the two trains proceed to the fixed meeting point; the dispatchers thus control the arrangements for meeting and passing up to the last moment, and just up to the moment the trains are ready to leave."

"Numbers are given to time card trains by the time card, and to special or extra trains or work trains by the dispatcher, who takes a number so far beyond those on the time card that operators and trainmen know that the number indicates an extra train. Fresh numbers are taken at the beginning of each week and run consecutively through to its close. Some roads use the number on the locomotives."

"Road or work trains, or pilots, or pushers, may be known through the week by the same specific number given them by the dispatcher. The conductor of the road train agrees with the dispatcher at the close of each night's work, where he will work on the morrow, and gets his permit, or train orders, accordingly, confining his runs to that district. Other trainmen interested are notified of the location of these road or work trains."

In general he commends the management "having thoroughly intelligent, cool-headed, practical officers, devoting their time to their duties, keeping pace with the times in needed economical improvements; employing only sober, intelligent, honest, provident, youngish men, whose appearance, manner, general conduct and discipline would likely entitle them to that promotion their reasonable ambition and length of service would warrant them to expect; the dispatchers and their officers in quiet, private offices—the right men in the right place—their rules and forms of train orders simple, explicit and fully understood and obeyed."

In concluding, Mr. Muir says:

"Railroad officials should always exhibit a visible desire to meet and satisfy the reasonable requirements of patrons and traders, being prompt and attentive to promises, and having some concern and anxiety for the interest of the employees when they are not upon duty. How many of the men when they finish their trip, away from their homes or boarding-houses, are left to wander about, subjects for temptation, led away to spend their time in questionable places, losing money and reputation; and in place of spending their time in rest and recreation nearer their work, and coming on duty fresh, rested, sober, cool and collected, come in a sleepy, dreamy condition not seen but felt through the working expenses column. I need not picture the result. No railroad is complete without employees' reading, recreation and resting rooms, well and attractively kept by elderly, sensible Christian men, who will watch and advise and take an interest in the welfare of employees at all terminal points."

American Engineers for Japan.

The following article is from the *Jiji-Simpo*, the leading Japanese newspaper:

"The construction of railroads in Japan has lately shown a marked progress. While the work of the government railroads is carried on with great haste, the number of the private lines proposed is daily increasing. Among the latter are the Kushu, the Ryomo, the Koto, the Yamato, and the Mito railroads, etc. We do not know as yet when the work will be commenced in each of these lines. But as it is said that several of them have already started in collecting funds, and others are only waiting to get the government's permission to begin the work, we may safely predict that hereafter in Japan there will be a great development of private railroads side by side with those of the government's."

"As our government must have their own policy in regard to railroads, we do not think it necessary to give them any advice. But as to the private corporations, whose object could be no other than to gain profit by railroad business, we should advise them to stick always to the strictest economy and try to build the longest lines of railroads with the smallest sum of money. And especially do we advise them to adopt for their model the inexpensive railroads of the United States. Not only has the growth of railroads been enormously rapid in America, but the railroads there are constructed for their practical usefulness, and not for the outward appearance. Hence the average cost of constructing railroads in America is very reasonable, being, as we understand, only about one-fourth of that in England. But are the advantages of the English railroad, therefore, four times as much as those of the American? By no means; in certain points the simplicity of the American railroad system may make it even superior to the English system. It is true that, if more money is spent, stations can be made more comfortable, roads made more permanent, and so on. Certainly we have no objection to our possessing railroads as expensively built as those of England. But we must remember that our railroads have to be made very quickly, and our capital is far from abundant. Under such circumstances as these, we would much sooner have four miles of the American railroad than one mile of the more perfect English railroad."

"After we have decided to construct our railroads according to the American plan, the question is: Are there enough engineers in our country who are familiar with the American system of railroad construction? As our railroad work is growing more and more extensive, we fear the time will soon come when we shall seriously feel the scarcity of competent native engineers. Even at present engineers are not at all too many in Japan. On the contrary, it is reported that there is a tendency of competition among our railroad companies to secure engineers by offering tempting salaries. If such is actually the case, the wisest course for these companies is to hire engineers in America, and let them construct our railroads. When a great engineering work is to be done in France, English laborers are often employed on account of their skill and industry. For a similar reason the Japanese should place the construction of their railroads in the hands of the Americans, who are undoubtedly the greatest engineering nation in the world. In order to carry on railroad business on such a great scale, the United States must have a vast number of good engineers. So the Japanese may probably be able to secure their service with comparatively little expense. At all events, we hope that those who are now contemplating to build private railroads in our country will, before starting in their work, consider this matter of introducing American engineers into our country."

Two empty beer kegs on the railroad track at Greenville, Ill., threw a passenger train from the rails and caused a delay of some little time. The Greenville *Advocate* wants to know, "If two empty beer kegs will stop a train, what will the contents of one keg do?" Put the contents into the engineer and fireman and it'll make the train go at the rate of two miles a minute.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The first reports of January earnings, given this week, are from three roads only, the totals being as follows:

	1887.	1886.	Increase.	P. c.
Total, 3 roads.....	\$832,113	\$653,600	\$178,513	27.3

Of the three roads the Long Island shows a small increase, as it has continued to do for over a year past. The Milwaukee, Lake Shore & Western shows a heavy gain, much larger than might have been expected when navigation is closed and ore shipments small. The Denver & Rio Grande compares with a very bad month last year, and shows accordingly a large increase.

December earnings are given in our columns this week by 14 roads, making 118 from which reports have thus far been published for the month. The totals are as follows:

	1886.	1885.	Increase.	P. c.
Reported this week, 14 roads.....	\$8,222,601	\$7,550,203	\$672,398	8.9
Total, 118 roads.....	\$2,971,480	\$3,757,248	\$4,214,182	10.9

This week's report includes several important roads. The Pennsylvania statement is, on the whole, a favorable one, although the increase in expenses was proportionally greater than that in gross earnings. The Erie and its leased line, the New York, Pennsylvania & Ohio, make a very good report, both showing large increases.

Ten of the roads reporting this week give net earnings also. Seven of these show gains; two—the Cincinnati, Hamilton & Dayton and the Norfolk & Western—losses, and one, the Camden & Atlantic, a sea-shore excursion road, had a deficit in both years.

The enormous increase of the railroad system of the country must appear injudicious to any one who has followed the course of earnings for some years past. With constantly decreasing earnings per mile and a railroad system developing in an enormously greater ratio than our population, and with the prices of materials rising toward the old figures of flush times, the day cannot be far distant when another reaction must set in.

As an offset to the above influences it is pleaded that the great roads are able to borrow money at five per cent. where they paid seven on the conditions under which their main lines were built. There is, undoubtedly, something in this, but it will not apply to entirely new schemes, of which many are on foot, and failure of which will be felt by the stocks of all the railroads of the country very nearly in the same proportion, as experience has shown again and again.

THE CAR COUPLER TRIBUNAL.

The letter from "Judex," which will be found in another column, contains many valuable suggestions, though it is accompanied by some ideas that will hardly be acceptable to railroad men. Superintendents and others who have been brakemen and have been promoted to high positions on account of their exceptional

ability, would undoubtedly be valuable members of a committee appointed to choose the best coupler or couplers for ultimate universal adoption. That a committee should be solely formed of such superintendents is, however, open to many objections. In the first place, such men have, in most instances, quite forgotten the mere manual dexterity necessary to couple cars, and have long since occupied themselves solely with the far more difficult and weighty problems brought before them as the superior officers of a railroad. In the next place, they would lack the mechanical knowledge and experience which is absolutely required in order to determine the merits of a coupler. They have little personal knowledge of the severity of the blows inflicted in handling modern heavy cars with the present build of heavy engines. A master car-builder, on the other hand, has this important factor brought continually before him. He has constantly to repair cars and couplers injured in switching, and can form an excellent idea of the conditions of actual service, and can judge whether a coupler is likely to do its work under varying circumstances without needing repairs. The opinion of one or more experienced brakemen should be valuable on many points, but a mechanical knowledge of the construction of couplers is also essential in a judge who has to determine the case and select the best couplers.

To couple two ordinary drawheads is a problem in manual dexterity of which an experienced and smart brakeman is the best judge, but it requires or should require no manual dexterity to couple two safety or automatic drawheads. It is purely a mechanical problem, and should be judged by mechanical men. A certain amount of dexterity is, however, undoubtedly required to couple many forms of automatic couplers with an ordinary link and pin drawhead, and here a brakeman might give valuable evidence, but the main question is clearly within the province of a mechanical engineer, who has made the construction and repair of cars his special study, and in this country such a person is styled a Superintendent of Motive Power or a Master Car-Builder. The Association formed by these gentlemen has ample knowledge and experience to decide this question, and would possess the one qualification still missing if they felt assured that their choice would receive the support of the superintendents and general managers above them. When this is frankly and unreservedly given the car coupler question will soon be decided. The ablest men must, however, be assured of moral support before they can fully display their ability. The question involves 1,000,000 cars, and at the very low cost of \$12 per car, the total value of the automatic couplers of the future is fully \$12,000,000! An immense sum, which possibly more than any purely mechanical question has delayed the solution. But here again the master car-builders are the best judges of cost. They have to make the new couplers and repair the old ones, and are better acquainted with the cost than the officers above them.

Exception may also be fairly taken to our correspondent's statement that a coupler that will couple with itself under all circumstances is still wanting. Experience has shown that many couplers do this very satisfactorily in actual service. Their performance may not be absolutely perfect, but the real serious trouble only begins when they meet other couplers. A collision with the Potter or the Safford or the Miller often proves disastrous, but many automatic couplers do well with their own kind. The difficulty of coupling with drawbars of other types will remain for some years at least, and will have to be met by all couplers which aspire to universal adoption. When that day arrives, they will undoubtedly have got into smooth water, but meanwhile they must face the storm.

The possibility of obtaining a coupler that will, under all circumstances, couple automatically with all the different styles of common drawhead is, of course, Utopian. No practical man has ever asked for such a device. But practical men do ask for a coupler that will couple with the ordinary drawhead with the least possible injury to trainmen, couplers and cars. In order to secure adoption, a coupler should do this and work well and couple automatically with its own type, and more than this can hardly be expected. Automatic action is chiefly valuable because it necessarily implies greater safety. As the men need not go between the cars they escape the greatest cause of injury. But an equal degree of safety may be secured by a coupler which, though not self-acting, can be worked without going between the cars. Such a coupler would at least enable all cars to be safely coupled, whether fitted with automatic couplers or not. It would thus bridge over the gap until automatic couplers of the same type are universally used.

THE NORRIS LOCOMOTIVE.

The account which we publish on another page of the Norris Locomotive of 1836 is very interesting, and its performance in ascending a grade of 369 ft. per mile will be read with surprise by many, even after half a century of progress in locomotive building. Few of the latest and presumably most improved locomotives are regularly ascending grades steeper than 280 ft. per mile, and grades as steep as those ascended by the old Norris engine might be counted on the fingers of one hand, if railroads worked with a grip or rack rail are excluded.

Only an engineer of very sanguine temperament would now propose to ascend a grade of 1 in 14.3 with a locomotive depending solely on the adhesion of a single pair of driving wheels, the power being supplied by steam of less than 60 lbs. pressure. This however is the feat performed half a century ago by the engine illustrated on another page. The performance is described in great detail by Mr. Henry L. Norris, Jr., a descendant of the builder, and his testimony is amply confirmed. The feat however is so remarkable that it is not surprising that it was very generally disbelieved at the time. The account of the descent shows that the train was kept under perfect control. Many engineers of the present day would consider the descent of such a grade a difficult matter even where a continuous brake in excellent working order was applied to every wheel in the train. To descend such a grade with no brake whatever on the engine, and no continuous brake on the cars would appear to many an engineer an exceedingly rash proceeding, likely to ditch the train and land him in the penitentiary or the graveyard. Yet it appears to have been accomplished 50 years ago, another proof that after all we are not so very much smarter than our fathers, and grandfathers.

It is interesting to note the figures given by Mr. Norris and examine them by the light of the usual and accepted formula as to the tractive power of a locomotive. The cylinders being 10½ in. diameter by 18 in. stroke and the wheels 48 in. diameter, the tractive power would be:

$$\frac{(10\frac{1}{2})^2 \times 13}{48} = 41.3 \text{ lbs. per lb.}$$

average pressure on pistons. The boiler pressure is stated by Mr. Norris to have been slightly under 60 lbs., and therefore allowing for back pressure, etc., it would certainly be highly unlikely that the average pressure in the cylinder exceeded 50 lbs. per sq. in. Assuming that this figure is correct, the gross tractive force of the engine would be—

$$41.3 \times 50 = 2,065 \text{ lbs.}$$

Mr. Norris gives the weight of the engine with water only, and therefore presumably does not reckon the weight of the coal. Accepting, however, his figures, the total weight hauled up the incline would be:

Engine.....	14,930 lbs.
Train.....	19,200 lbs.
Total.....	34,130 lbs.

The resistance due to gravity would be:

$$\frac{34,130}{14.3} = 2,387 \text{ lbs. nearly.}$$

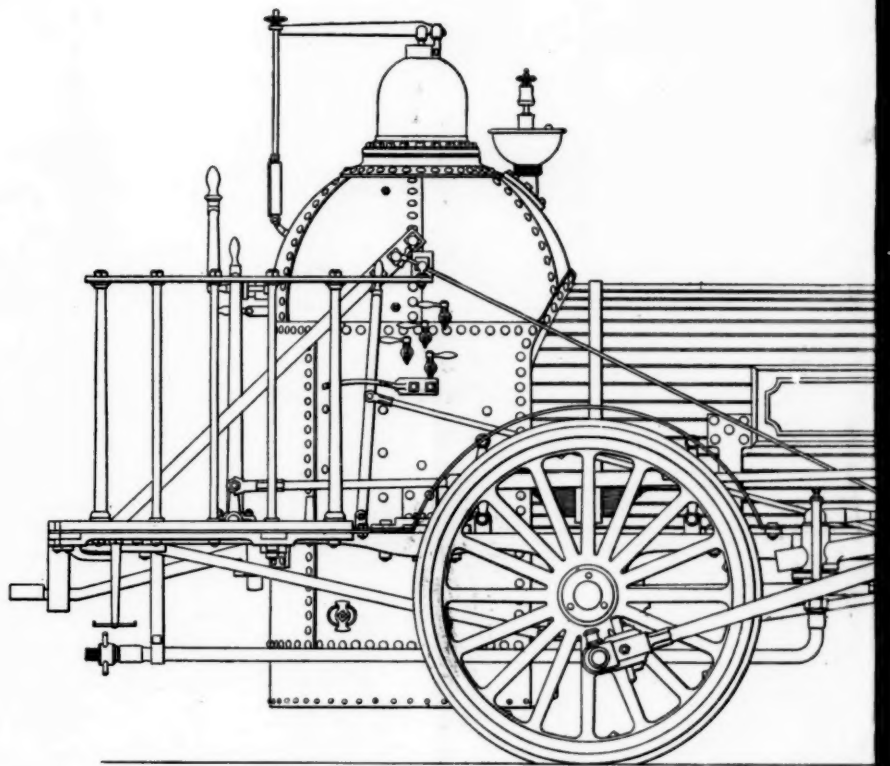
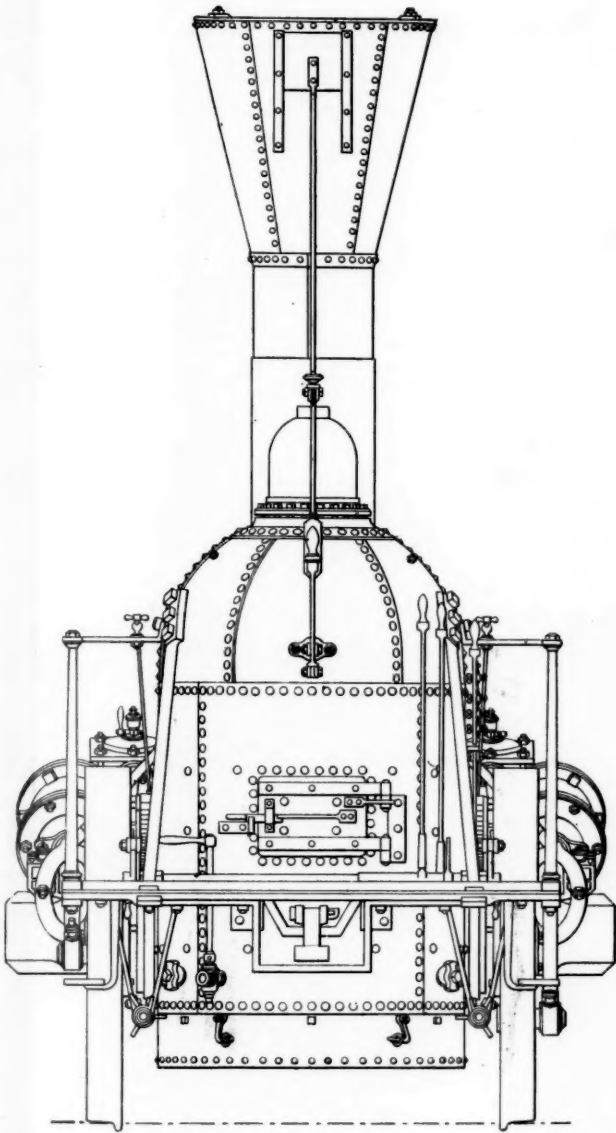
The friction of the engine and cars of that period would probably be not less than 8 lbs. per ton, and as the engine and train weighed rather over 17 tons, the gross friction may be taken at 136 lbs. The total resistance, therefore, which the engine had to overcome was approximately as follows:

Gravity.....	2,387 lbs.
Friction.....	136
Total.....	2,523

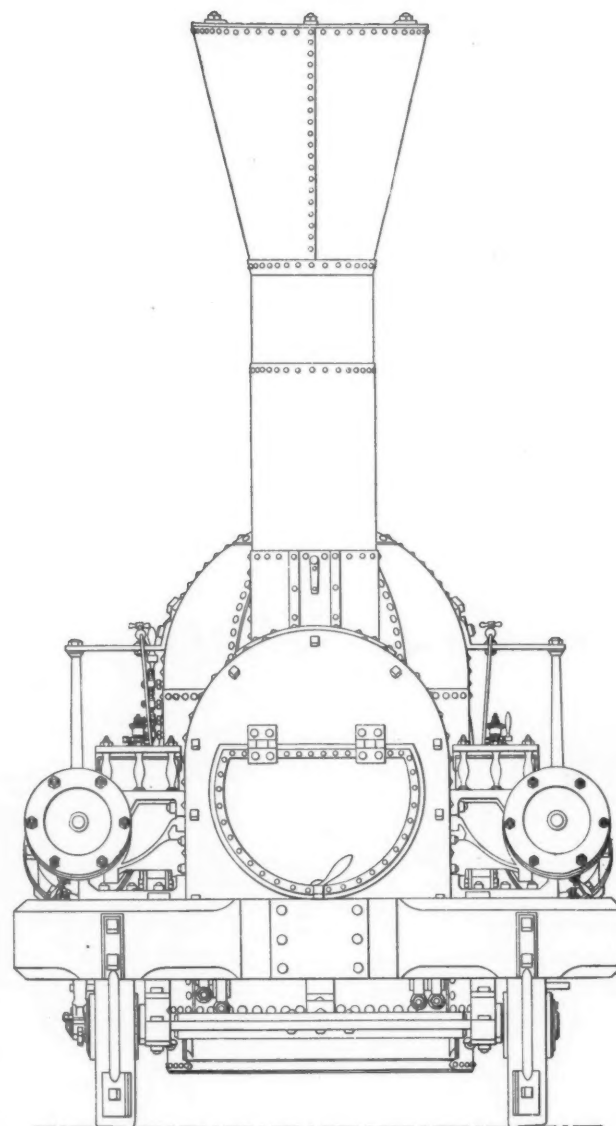
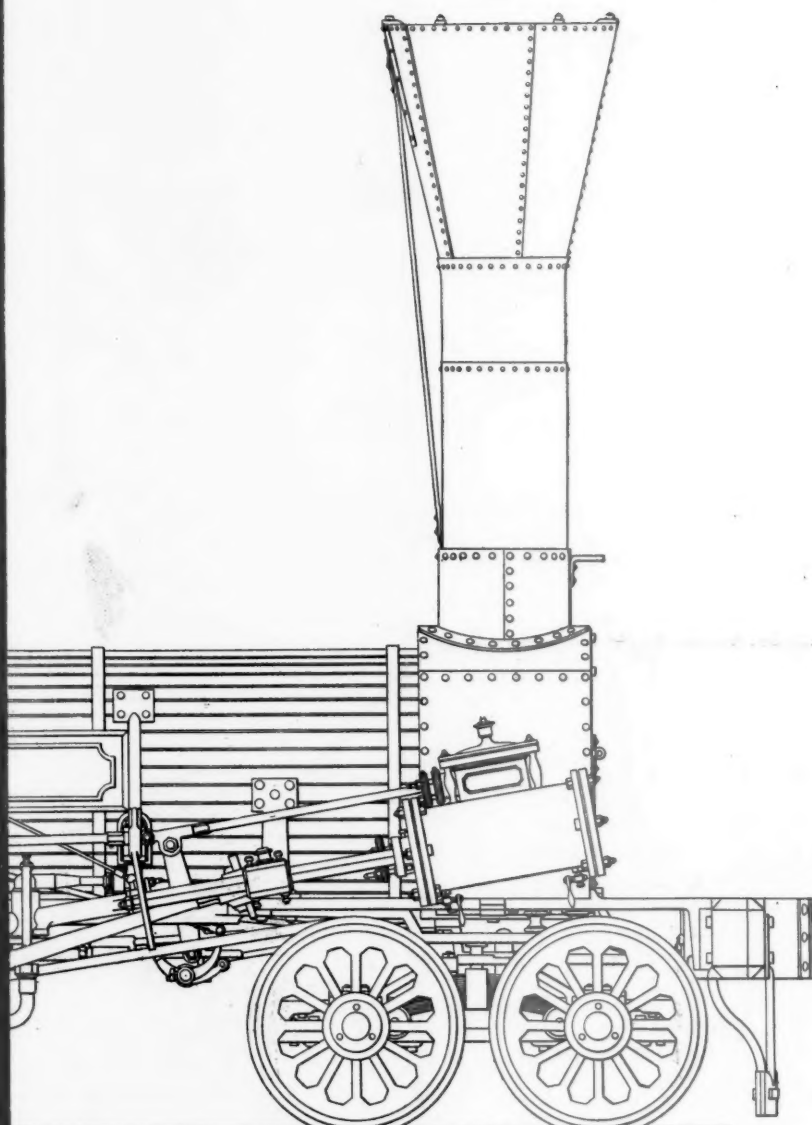
It has been already shown that the probable maximum tractive force of the engine was 2,065 lbs., and therefore it would appear that the resistance exceeded the tractive power of the engine by nearly 500 lbs. The incredulity of contemporary rivals of the Norris Locomotive Works appears therefore to have had some foundation. The discrepancy may, however, have been due to several causes. The pressure gauge may have been wrong, and an error of 12 lbs. per sq. in. would settle the whole question. The tractive power of the engine, with an average pressure on the pistons of 62 lbs. per sq. in., would be:

$$41.3 \times 62 = 2,560 \text{ lbs.}$$

amplified sufficient to overcome the gross resistance of the train. Pressure gauges even now are very frequently defective, and show pressures largely different from the real amount. The pressure gauges of fifty years ago were, however, notoriously defective. The Bourdon pressure gauge was not then invented, and the manufacture of safety-valve springs was rough and imperfect, and the results obtained were often very unsatisfactory and misleading. This one cause of error fully accounts for the feat of which our correspondent is so justly proud, and also justifies the disbelief in the performance expressed in many quarters.



THE NORRIS LOCOMOTIVE, 1836. THE FIRST L



RST LOCOMOTIVE TO ASCEND A HEAVY GRADE

It seems impossible to avoid the conclusion that the pressure gauge was wrong, for it is difficult to see what other factor could have been in error by nearly 25 per cent. Possibly the weights were somewhat incorrectly taken and partly guessed at, but the guessing that left so large an error must have been singularly wide of the mark. The weighing machines of those days were crude, and were doubtless often very inaccurate, and it is well known that modern weighing bridges will give very erroneous results if not carefully examined and cleaned at frequent intervals.

EYESIGHT OF RAILROAD MEN.

Dr. B. Joy Jeffries, of Boston, the original apostle of reform in railroad men's vision, gives, in a paper read before the American Ophthalmological Society, some striking instances of the injustice and inefficiency possible under a law which, like the present one in Massachusetts, permits the examinations to be made by poorly qualified persons and under empirical rules. The law says that examinations must be made by a competent person, but so long as no one takes it upon himself to bring the matter into the courts for a decision as to what constitutes a competent person, the most ignorant or careless superintendent is at liberty to decide the question for himself.

Dr. Jeffries refers to numerous cases of total disregard of the law by companies; employes being found who have never been examined, and others coming of their own motion to satisfy themselves that their eyes are sound and normal. In the case of one brakeman, "The only test he had was the train dispatcher asking him how many knobs there were on an adjacent telegraph pole, and telling him his vision was as good as any one on the road."

Other cases are cited as follows:

"No. 6.—A gateman applies to me for a certificate for full pension for blindness contracted in the army. He groped his way into my office. He had white atrophy of optic nerve in each eye. He says at times he is completely blind in the sun, so he cannot see people on his crossing, which is an important one. He holds a certificate from his road examiner, 'that he is not disqualified by defective sight.'"

Gatemen are probably not included in the provisions of the law, but prudence would seem to dictate that such cases as this be looked after by the examining officer.

"No. 3.—A brakeman or fireman whose turn came soon after an engineer who was badly color-blind made all the characteristic mistakes of a color-blind with the three Holmgren tests. He was quite convinced himself that he was color-blind, and resigned to rejection. The superintendent and the other employes were equally convinced from their own observations of the man's dangerous color-blindness. An experience with some 30,000 examinations had, however, taught me, that while the man made the most thorough and characteristic mistakes of defective color sense, he did not make them in the way the color-blind do. I first thought he was deceiving me and imitating the color-blind engineer preceding him. It proved that he had carefully watched and imitated him, not with the idea of deceiving, but because he supposed this engineer was right and all the normal eyed selections he had seen were defective. He would have been rejected on all other roads where no expert was employed; a legal injustice."

"No. 4.—An engineer whom I found incompletely color-blind was doubted, and no certificate given him by his road (rendered liable to \$100 fine), although he was allowed to run. An accident happening frightened the officials, and his 'boss' was telegraphed to let no one out that night without a certificate. He having none was dropped. He would not have been under legal standards, from his term of service and success, or he could have been transferred to day work."

If examination of employes is to be made at all, it ought to go without saying that it should be done scientifically; and it would seem as though the general "scare" which spreads among the employes of a road when they hear of an impending test, might be obviated if proper gentle and considerate explanations were made by the superintendent in his announcement. Stroking the fur the right way is just as good an idea for the operating department to follow in dealing with employes as for the passenger department to employ in approaching the public.

Massachusetts Railroad Legislation in 1886.

Although there was no very radical railroad legislation in Massachusetts during the past year, a number of acts have been passed affecting minor details of railroad management. The general law requiring all corporations to pay their employes weekly, of course applied to railroads, as well as manufacturing companies. The Board of Railroad Commissioners reports no complaint under this head, but it is generally understood that at least one of the railroad companies practically evades the operation of the law. Certain legislation intended to provide for the formation of employes relief societies has also proved inoperative.

Of much greater practical effect has been the legislation regarding matters of public safety. Chapter 180, Acts of 1886, provides that all railroads in the state shall, before Jan. 1, 1887, have all frogs, switches and guard rails on its track (except guard-rails on bridges) adjusted, filled or blocked so as to prevent the feet of its employes from being caught therein. The work is to be done to the satisfaction of the Board, shown by the certificate of their clerk.

In this enactment, the state followed the lead of Michigan, where such a law has been for some time in successful operation. On two roads in this State, the Boston & Albany and the Fitchburg, the work was completed before the passage of the act. On the Old Colony it was begun, and has now far

advanced toward completion. Upon most of the roads' progress in this matter has been slow.

An act was passed, providing for the test by the commissioners of additional safety freight couplers besides those recommended at the first trial under the act of 1884. It was thought by the framers of this additional legislation that new inventions might possibly be devised which should prove superior to the devices originally adopted; and that, by a system of successive tests, a fair compromise was afforded between a rigid standard which should exclude the adoption of any such new devices, and an absence of standard which should prevent all uniformity. The result of the trials and examinations made by the Board was the adoption of the Boston Automatic Safety Coupler, which was added to the list approved for use in this state.

Replies to a special circular show that the numbers of approved couplers applied during the year are as follows: Ames, 1,356; Cowell, 111; Hein, 114; Janney, 12; United States, 2,172. In addition to these, the New York, New Haven & Hartford Railroad Company has put on 1,376 Whittemore couplers, which have been approved by the Commissioners of Connecticut. The total number of couplers prescribed by this board and now in use on the railroads of the state is as follows: Ames, 1,350; Cowell, 194; Hein, 506; Janney, 12; United States, 3,012. The Cheshire Railroad has put in 150 Saffords.

Only one accident, a slight one, occurred in connection with the use of any of these couplers, and it did not appear that the nature of the device had any bearing on the accident.

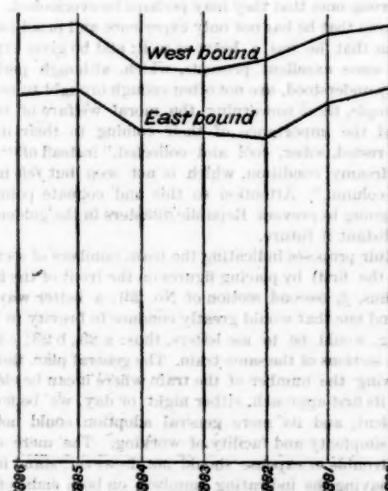
The Commissioners have little hope of securing uniformity without congressional action on the subject. They say:

"The tendency of opinion among railroad men is toward the selection of some vertical plane coupler. But it seems doubtful whether any one will be universally adopted, unless its use for inter-state commerce shall be compelled by congressional action. It would seem, however, that all compulsory state legislation, prescribing the use of any one coupler, must be unconstitutional and void so far as it relates to inter-state commerce."

A resolve was passed with regard to the use of a guard-rail on box cars, and the railroad commissioners were instructed to give a hearing with regard to the necessity of legislation on the subject; but no one appeared to advocate any change. The commissioners speak in favor of legislation, perhaps by Congress, making the use of power brakes general; in favor of safety valves to prevent the escape of steam in case of accident; and, most of all, in favor of a system of heating cars by steam from the locomotives. They strongly indorse the Martin anti-fire car heater, and speak with approval of the experiments of the Boston & Albany Railroad Company, and of Mr. Emerson on the Connecticut River Railroad.

Trunk Line Through Freight Traffic.*

EAST-BOUND.



The east-bound trunk line tonnage for December last was 1,053,878 tons, being an increase of 58,007 tons over the business for December, 1885. It is a larger traffic than the trunk lines have had during the month of December within the last seven years, if ever it has been equaled. The December tonnage for seven years has been:

1880	1881	1882	1883	1884	1885	1886
975,162	758,522	1,011,747	738,876	893,168	995,871	1,053,878

The annual east-bound dead freight traffic over the trunk lines (including all shipments originating at or passing through trunk line western termini, and destined to any point east thereof) has been, in tons, as follows during the last seven years:

1880	1881	1882	1883
11,447,389	10,889,820	9,891,446	10,033,435
1884	1885	1886	
10,082,987	11,354,001	11,236,169	

The shipments for the first six months last year were about half a million tons less than for the first six months of 1885, but since June, with one exception, the tonnage each month has been larger than for the same month in 1885. The exception was the month of September, when the shipments were about 30,000 tons less than for September, 1885. The tonnage for the last six months of 1886 was greater than that for the corresponding six months of any year since 1880; but in 1880 it was about 100,000 tons more than last year.

* In the diagram the space between the base line and the east-bound traffic line represents the volume of the east-bound traffic, while the space between the two traffic lines represents the volume of west-bound traffic. The length on any year line from the base to the upper line represents the total amount of business east and west-bound together for that year.

Taking in consideration the business for the entire year, it must be remembered that while the traffic for 1886 was 118,000 tons, or a little over 1 per cent. less than for 1885, not only the gross revenue but the net revenue or profit to railroads was vastly greater in 1886 than in 1885, as in 1886 the rates were, for the season of open navigation at least, on a fairly profitable basis, and were tolerably well maintained. The tariff was for the entire year, with the exception of a few days in December, on the basis of 25 cents on 13th class. It is held that while this was a reasonable rate for the season of open navigation, the winter basis should be at least five cents per 100 lbs. higher, by reason of the additional cost of transportation. However, the 25-cent basis was much more satisfactory than the rates that were in effect in 1885, when a bitter railroad war was being carried on and rates dropped so low as to leave no profit to the railroads on a large amount of the traffic.

While the east-bound business of the trunk lines is an immense traffic, the variations in the respective amounts for the various years of which we have any record have not been very marked. While with the growth of population in the Eastern states there must naturally be an increase in the movement of food products from the West to feed this increased population, this natural growth of the domestic business has some years been more than counterbalanced by the fluctuations in the foreign demand for our grain and other food products. It must also be borne in mind that when the trunk lines maintain tariffs on any basis that will return them a reasonable profit on the business, a greater amount of traffic will be diverted to the outside rail competitors, and also to the canal.

As shown in another article, the shipments of grain to New York by the Erie Canal were very much greater last year than they were in 1885. The only statement that we have seen of the through east-bound shipments by the Lehigh Valley referred exclusively to flour and grain shipments; but while the through business of that road is but small as compared with that of the roads in the Trunk Line pool, it is but fair to assume that the increase in its tonnage in 1886 over that of 1885 more than counterbalanced the 118,000 tons decrease in the Trunk Line tonnage.

WEST-BOUND.

The west-bound traffic from the four seaboard cities (Boston, New York, Philadelphia and Baltimore), for the year 1886 was 2,032,576 tons; and for the last seven years the annual movement has been:

1880	1881	1882	1883	1884	1885	1886
1,871,770	2,120,205	2,569,806	1,890,559	1,920,845	2,045,025	2,032,576

The traffic last year was but slightly less than in 1885. In fact, there have been no very great changes in the volume of this traffic during the seven years, the movement in 1882 (the year with the largest traffic), being only between 17 and 18 per cent. greater than last year; but many of the contracts made during the railroad war of 1881 did not all expire until about July, 1882, and this fact no doubt greatly influenced the movement for that year. It would be natural to suppose that with the growth of the population in the Western states, there would be a steady increase in the amount of the shipments from the seaboard cities, the shipments being to a very considerable extent supplies and manufactured articles; but this does not appear to be the case. A possible explanation for this may be that the methods of doing business have been changed, and that shipments are now made from the mills, etc., direct, instead of being consigned to agents at the seaboard cities and reshipped thence to destination. The shipments from the eleven competing points in interior New England have doubled since 1880, but the total amount of this traffic is comparatively small, being only about 100,000 tons per annum. How large a proportion the traffic from these points is of the total interior New England shipments to the West we cannot tell. The growth of manufacturing industries in the West would also have an effect on the west-bound shipments from the seaboard, especially such manufactures as are able to get a certain amount if not all of their raw material in that section of the country.

If the tonnage last year was not quite as much as it was in 1885, the railroads have obtained increased earnings from the business. For the entire year of 1886, the west-bound tariff rates were on the 75 cent basis to Chicago, while during a portion of 1885 the tariffs were on the basis of 50 cents. This, of itself, would be sufficient to make a very material difference in the earnings of the two years; but while there have, no doubt, been times in 1886 when tariffs were rather loosely observed, there was no such general demoralization as prevailed during a considerable portion of 1885.

East-bound Shipments from Chicago.

The east-bound shipments of through freight from Chicago (not including live stock and dressed meats) in the month of December last by the roads in the Central Traffic Association were 249,448 tons. This does not include the unreported shipments of the Chicago & Atlantic, which would probably bring the total shipments up to about 290,000 tons. The total dead freight shipments from Chicago in December have been for the last seven years, in tons:

1880	1881	1882	1883	1884	1885	1886
244,700	259,336	280,151	202,069	283,400	239,840	290,000

The shipments last month were over 20 per cent. more than in December, 1885, and greater than those of the same month in any of the previous years, except December, 1882, when, including business of the outside junction points, the shipments were about 305,000 tons. It must be remembered that prior to 1883 the business of sundry outside junction points was not reported in the Chicago division of traffic, and that the inclusion of this traffic would increase

the totals for 1880, 1881 and 1882 about 9 per cent. above those shown in the foregoing table.

The total through shipments from Chicago for the year (estimating the business of the Chicago & Atlantic since March 1) was about 2,200,000 tons, and for the last seven years the annual dead freight shipments have been:

Year.	Tons.	Year.	Tons.
1880	2,300,640	1884	2,835,364
1881	2,889,317	1885	3,187,184
1882	2,129,089	1886	2,200,000
1883	2,401,488		

The shipments last year were about 30 per cent. less than those of 1885, and in fact were smaller than those of any of the other years, except 1882, when, including the business at outside junctions, the amount was about the same. The rail shipments in 1885 were decidedly larger than those of any other year. This probably was in consequence of the extremely low rail rates which prevailed during the greater part of the year, which diverted to the rail lines a large amount of traffic that, under ordinary circumstances, would have been forwarded by lake. The lake rates were so low that many vessels went out of the grain business, and carried ore and other coarse freights instead. In 1886 the condition of affairs was exactly reversed. The all-rail rates were on a very much higher basis, and consequently the lake rates were correspondingly advanced. In 1885 the highest lake rate on wheat from Chicago to Buffalo was 3½ cents per bushel, and the lowest rate 1 cent. In 1886 the highest lake rate between the same points was, on wheat, 5½ cents per bushel, and the lowest 2½ cents. The effect of this great difference in rates is indicated by the lake receipts of grain and flour at Buffalo, which was 93,000,000 bushels in 1886 and only 63,000,000 bushels in 1885, an increase last year of about 50 per cent. over 1885.

Chicago Cattle and Dressed Beef Shipments.

The cattle and dressed beef shipments from Chicago for the month of December were, in tons:

	1886.	1885.	Increase.	P. c.
Cattle	31,228	30,769	459	1.5
beef	17,799	17,538	261	1.5
Dressed beef	23,714	21,565	2,149	9.9
Total	41,513	39,114	2,410	6.0

The total shipments for the year have been:

	1886.	1885.	Inc. or Dec.	P. c.
Cattle	387,402	386,519	D. 10,117	4.9
beef	209,419	220,316	D. 10,897	4.9
Dressed beef	278,688	231,634	I. 47,054	20.3
Total	488,087	451,950	I. 36,137	8.0

The total shipments of cattle and dressed beef last year were 8 per cent. more than the shipments in 1885. This, of course, was to be expected with the increased consumption. The cattle shipments, however, fell off about five per cent. last year; and the increase was entirely in the dressed beef shipments. In 1885 the dressed beef shipments were 51.5 per cent. of the aggregate shipments, cattle reduced to equivalent beef; in 1886 they were 57.1 per cent. A large number of the cattle included in the Chicago shipments are only carried to Hammond, a point only a few miles east of Chicago, and there slaughtered and reshipped east as dressed beef. If the slaughtering business at that point was larger last year than in 1885, of course the relative increase in the dressed beef traffic is greater than shown in the foregoing statement.

Prior to March 1, last, the tariff rates on dressed beef were seventy-five per cent. higher than the cattle rates; but it was decided that from that date the rates on dressed beef should not be a fixed percentage above the cattle rates, but that the rates on each class of traffic should be determined separately. On March 1, the tariff rate on cattle was made 35 cents per 100 lbs., Chicago to New York, and on dressed beef 65 cents. Under this basis the dressed beef rate is about 86 per cent. higher than the cattle rate, instead of 75 per cent. as heretofore. This increase in the relative rates on the two classes of traffic does not appear to have interfered much with the growth of the dressed beef business; but as it is generally acknowledged that the rates have not been maintained, it is possible that the differences in the tariff rates as agreed upon to take effect on March 1, last, have not been observed in making private agreements with shippers as to what the actual rates should be.

Earnings and Expenses of the Trunk Lines for 1886.

We are able this year to give the earnings of three of the trunk lines for the calendar year 1886, as given below. The Baltimore & Ohio has not reported its monthly earnings during the year past:

Pennsylvania:			
	1886.	1885.	Increase.
Gross	\$50,379,070	\$45,615,027	\$4,764,043
Expenses	32,619,588	29,479,758	2,139,830
Net	\$17,759,482	\$16,135,269	\$1,624,213
N. Y. Central & H. R. (including the West Shore for 1886):			
Gross	\$31,605,760	\$24,495,873	\$8,109,887
Expenses	19,876,168	16,521,493	3,354,675
Net	\$11,729,591	\$7,974,378	\$3,755,213
N. Y. Lake Erie & Western (including all earnings of N. Y. P. & O.):			
Gross	\$24,021,306	\$21,212,550	\$2,808,816
Expenses	16,718,072	14,638,264	2,080,408
Net	\$7,303,234	\$6,574,286	\$728,948

The large increase in the New York Central earnings is due to the absorption of the West Shore, but after deducting the fixed charges due to this there still remains an increase of 34.6 per cent. in net earnings.

With the exception of this result, which is eminently gratifying to the Central stockholders, the losses of the year 1886 do not appear to be made up by the gains of last year.

Muir on the Details of Railroad Working.

Mr. W. K. Muir's paper "On the Working of Traffic upon Single-track Railroads in Canada and the United States," read by him at the Montreal meeting of the British Association, and from which we reprint in another column some extracts, has a title which is somewhat misleading, as the subject matter refers to the whole general subject of train running, and a large portion of it applies to double track working as well as single. This does not impair its value; however, and our insular cousins who heard it received, it is safe to say, a broader and better impression of American methods than they every did before in anything like the same time or space; for Mr. Muir condensed into a few pages a mass of facts and suggestions such as can be found in few if any places without going over ten times the ground here taken. Indeed, there are scattered through the pamphlet so many really valuable points in train running which, notwithstanding their importance, are widely neglected, that we recommend all American railroad men to study it, and keep it for reference; not because the facts are all new, by any means, but because important things are here collated in an accessible form, so that tangible paper and visible ink can be used as an aid to the memory.

Mr. Muir recommends for meeting places long sidings on both sides of the main track with a switch midway, so that when two trains are waiting either one of them can be run onto the main track without disturbing the other; the station tracks (to freight house, etc.) being connected with one of these long sidings and thus located at least two removes from the main track. It would make more convenient working, though, and require fewer switches in the main track, to have the side tracks each long enough for a single train (of the maximum length), and have enough of them placed side by side; and except for the purpose of making provision for future double track conditions, they might just as well be all on one side of the main line, thus allowing the station tracks to be placed contiguous to the main. In connection with grade crossings, stations, etc., the author speaks of the necessity of distant signals; but like nearly every one else who writes upon this subject, omits to say how far distant they should be, apparently assuming that every engineer can see signals a greater or less distance before he reaches them; whereas the only safe way is to fix them where they will give sufficient warning, even if not seen until they are reached. It seems to be assumed throughout the paper that the proper number of brakemen for a train is always two; a better idea of the safety of American roads would have been conveyed to our trans-Atlantic friends, and a more correct one, if they had been informed that three or four, or more, is the rule on many well-managed roads, where trains are of any considerable length.

We did not set out, however, to exhibit the author's weak points; what there are of them are in the company of so many strong ones that they may perhaps be overlooked. Mr. Muir shows that he has not only experience and practical insight, but that he has a heart as well; and he gives expression to some excellent precepts, which, although perhaps generally understood, are not often enough brought to notice. For example, those concerning the moral welfare of trainmen, and the importance of their coming to their duties "fresh, rested, sober, cool and collected," instead of "in a sleepy, dreamy condition, which is not seen but felt in the expense column." Attention to this and cognate points is what is going to prevent Republic disasters in the golden age of the (distant) future.

Mr. Muir proposes indicating the train numbers of sections (except the first) by placing figures on the front of the headlight, thus, 3 (second section of No. 23); a better way, we think, and one that would greatly conduce to brevity in telegraphing, would be to use letters, thus: a 23; b 23; c 23 to indicate sections of the same train. The general plan, though, of showing the number of the train where it can be clearly seen on its first approach, either night or day, we believe to be excellent, and its more general adoption could not but tend to simplicity and facility of working. The mere question of trouble or expense should not, however, stand in the way of having the indicating numbers on both ends of the train where experience shows it to be of value.

Mr. Muir's suggestion that passenger cars can be always run with saloons at the rear is a reminder of the value of a Y track on which whole trains can be turned at once, and of the desirability that every road should take every available opportunity to secure the land for such a track at principal stations before its value rises to a point which makes it out of the question.

The V-shaped case for a train indicator is mentioned. This device has been adopted during the past few years by some of the most careful managers, and deserves to be used by still more of them. We think, however, that it would pay to have (on double track lines) one for each track, instead of requiring the enginemen running in one direction to look across to the station on their left-hand side, as in the general practice.

It is pleasant to hear such a flattering opinion of our engineering profession as is expressed in an article from a leading Japanese paper, reprinted by us in another column. It is evident there is going to be a field in Japan for enterprising American engineers, but if, as predicted by Poor's Manual, we ourselves are going to build 12,000 miles of railroad, there would seem to be plenty of work for our engineers at home. It is a pity that the Japanese couldn't postpone their railroad building until we fall into the reaction which is pretty sure to follow this abnormal and unhealthy activity.

In another column will be found some interesting figures

concerning the amount of traffic passing a well-known busy grade crossing in Springfield, Massachusetts. Appearances are often deceitful, and a few simple facts like these often place a problem in a light far different from that generally accepted when guesswork or "estimates" are relied upon. Doubtless many a superintendent would open his eyes in considerable surprise if the risks he is running at some of his grade crossings were shown up in cold figures like these at Springfield.

The Vermont Railroad Commission, of which very little has heretofore been heard, has been wrestling with its first accident case. It was hardly an important or complicated one, being simply a collision (whether rear or butting is not stated), between a passenger train on the Central Vermont and one Hedgesville Branch which resulted in the demolition of Mr. Bracq. The Commissioners, however, having considered the case very carefully and looked at it in all possible lights, have decided to make it the occasion for proclaiming a great general principle for the benefit alike of the railroad world and the general public. This principle they announce both concisely and comprehensively as follows:

"The conclusion of this Board is, that it is dangerous for people to walk upon the railroad track."

What profound wisdom may be expected in the second decision of a Commission which thus distinguishes itself in the first attempt!

The sizes of the locomotives built by a large and old established firm like the Rogers Locomotive and Machine Works give a very fair idea of the leading dimension of locomotives in most general use throughout the country. The following table compiled from one given in work just issued by that firm, "Locomotives and Locomotive Building in America," gives a very fair idea of the gradual growth in the size of locomotives. The annual average output is given below for four periods of six years each, the locomotives being grouped according to the diameter of their cylinders, which is usually a very fair criterion of weight and power. The table shows clearly the gradual growth in size, the number of small engines built in each period gradually diminishing, while the figures show that the engines with larger cylinders are in increasing demand. Many will, however, be surprised to see the large number of small engines still built, and the fact that a 17-inch cylinder is still the favorite size is somewhat astonishing, considering the very general use of Mogul and Consolidation engines.

Average Annual Output of Locomotives, Rogers Locomotive & Machine Works.

	1850 to 1855.	1855 to 1865.	1865 to 1875.	1875 to 1885.
Size of cylinders.				
14 inch and under	34	18	19	7
15 " and 15½ in.	25	22	22	12
16 " and 16½ in.	9	26	47	22
17 " and 17½ in.	4	2	23	51
18 " and 18½ in.	1	4	12	45
19 " and 19½ in.	21
20 " and 20½ in.	15
Total average annual output.....	73	72	123	173

As a contribution to the records of the relative merits of different rail splices, we can state on the best possible authority that the West Shore splice has a record of "no breakage" since the road was built. It is a supported angle splice 36 inches long, weighing 44 lbs., with four bolts, the whole splice bridging 3 ties; has been in use now for four years.

During the summer of 1886 two pairs of these splices were taken out from the track for testing from the part of the Western Division, which is operated as a single track, one from a pile bridge and the other from light gravel ballast. On examination with straight edges they were found "perfect in line in every respect, without the slightest indication of over strain on any part."

The trackmen report but little more work in keeping up the joint ties than the "intermediates."

The local rates of the Pacific railroads have been, for a variety of reasons, exceptionally heavy. A case recently brought to notice, of high and almost prohibitory rates—sixteen dollars a ton from Chicago to Colorado Springs, charged the North Chicago Rolling Mills by the Colorado pool authorities, and especially by the Union Pacific Railroad, seems to involve special hardship. It is charged that this rate is made to prevent the construction of rival lines which might divide traffic; and its existence is made an argument against the power of pools, and, indirectly at least, in favor of more active government regulation of Union Pacific affairs.

Now, without expressing anything like a final opinion on the merits of the case, it is enough to say that neither of these inferences is fully justified by the facts. It is unquestionably a short-sighted policy for a railroad to charge high local rates. But a pool prevents such policy in a dozen cases for one case where it encourages it. More than that: it is safe to say that those cases where pooling seems to be the means of upholding such a practice, are really instances of the effect of refusing recognition to pooling contracts.

If such a contract has a permanent authority, it gives the chance for systematic arrangement of tariffs; if not, the roads are forced to make hay while the sun shines—putting rates up for to-day while they are agreed, because to-morrow any one of them may precipitate a war. But this is not a result of pools; it is a result of their weakness. And in like manner, the argument in favor of government interference with the affairs of the company is unsound, because the immediate effect of such interference would be an increase of financial embarrassment; and a road which is financially embarrassed is in a manner forced to pursue a shortsighted policy, squeezing its local traffic, and securing through traffic by all sorts of discriminations.

We are not for one moment defending the system of high local rates. So far as through and local rates can be equal-

ized, it is a good thing. So far as public discussions like the present one will help to call attention to the inequalities, and thus force a better system upon the railroad companies, we approve of it and sympathize with it. But we believe that the inferences which many newspapers have drawn from the facts presented are wrong, and that the means proposed for remedying them would have the indirect effect of increasing those very inequalities which it is proposed to diminish, and if there is to be an inequality anywhere, it may as well be at the expense of the steel rail makers as anybody else. When the steel rail works rebuke railroad pools, it reminds one a little of Satan rebuking sin.

The New York Herald of Jan. 30 has the following:
ASLEEP ON THE LOCOMOTIVE.

ALMOST MIRACULOUS ESCAPE FROM ANOTHER CATASTROPHE AT REPUBLIC.

[BY TELEGRAPH TO THE HERALD.]

TIFFIN, Ohio, Jan. 19, 1887.—The Baltimore and Ohio Railroad came very near having another fearful wreck at Republic early this morning. An east-bound freight train thundered past the depot when the limited express was almost due, and the operator stopped it only by hurling a large stone through the window of the caboose, awakening the conductor, who managed to stop the train and back on to the siding just one minute before train No. 5 rushed past.

These were identically the same numbered trains that caused the other collision. The engineer had been on duty nearly twenty hours, and did not see the danger signal at the station.

If this were an exceptional case, and not a fair sample of the attempts at sensation which the New York papers encourage their "correspondents" to indulge in every day, it would not, perhaps, be worthy of notice, but as equally improbable yarns are very frequently thrust before the readers of the "Metropolitan" dailies it is well to let the wind out of them occasionally. The facts in this case were: that an east bound freight train arriving at Republic 20 minutes or more clear of a west-bound passenger train (not the limited though) found the first switch, the one that would naturally be used, out of order, and so passed beyond the station about 100 feet so as to back in at the east end of the side track. The operator, seeing this unusual operation, went outside so as to satisfy himself that nothing was wrong. "Only this and nothing more." The track was cleared for the passenger train in ample season, as called for by the rules. The Herald's expenses for brain power must be enormous.

The order of Railway Telegraphers has among its cardinal principles: Opposition to strikes and boycotts, to the indiscriminate teaching of the art of telegraphy, and to the use of intoxicating drinks either on or off duty.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines in 1887 is given in the current number of the Railroad Gazette as follows:

Gulf, Colorado & Santa Fe.—Extended from Red River, Ind. Ter., north 23 miles.

Rome & Decatur.—Track laid from Rome, Ga., west 4 miles.

St. Louis, Arkansas & Texas.—The Sherman Branch is extended west to Mt. Vernon, Tex., 6 miles.

St. Louis & San Francisco.—Extended southward to Winding Stairs, Ind. Ter., 35 miles.

San Antonio & Aransas Pass.—The Waco Branch is extended from Yorktown, Tex., east to Cuero, 17 miles.

Southern Pacific.—The new Coast Line is extended 10 miles northwest of Newhall, Cal.

This is a total of 95 miles for the week, making 155 miles reported thus far for the current year. The new track reported to the corresponding date for 16 years has been:

Miles.	Miles.	Miles.	Miles.
1887.....155	1883.....70	1879.....70	1875.....62
1886.....62	1882.....192	1878.....84	1874.....32
1885.....36	1881.....110	1877.....42	1873.....210
1884.....93	1880.....176	1876.....70	1872.....70

This statement covers main track only, second or other additional tracks and sidings not being counted.

NEW PUBLICATIONS.

Burlington Route Pronouncing Dictionary. Issued by the Passenger Department of the Chicago, Burlington & Quincy Railroad.

This is a new departure in the railroad advertising line, and is more likely than any of its predecessors to be preserved in the homes and pockets of the great public. It is a neatly bound and printed pocket dictionary of the English language, necessarily much smaller than a "Webster's Unabridged," but containing a large number of words and definitions. The only variation from an ordinary dictionary is a single line across the top of each page, calling attention to some one of the attractive features of the "Great Burlington Route," which will thus be impressed upon the minds of all who have occasion to refer to the dictionary.

THE SCRAP HEAP.

Railroad Young Men's Christian Association.

From the Monthly Reporter, issued by the Association in New York, we take the following notes:

"For the Thursday Bible Class we could take much space to tell of its decided influence for good on the fellows. The course of topics from 'Our Lord's Parables' is just the one our friends need."

"We want to see a larger attendance at our Sunday Meetings. They are so good that we would be glad to have the many railroad employes in the city just fill the room every Sunday afternoon."

"The Dining Room is a very popular and useful feature of our work. Every evening at supper time it has the appearance of a full-fledged restaurant. The men frequently cook a regular dinner of meat and vegetables, just as they would at home."

"Gratifying progress has been made in the work of erect-

ing our new building. The girders for the second floor were laid some time since, and but for the interference of cold weather, there would doubtless have been even greater progress to report. Every fair day is taken advantage of by the contractor."

"The fourth lecture in our regular course will be delivered on Feb. 10 by W. R. Davenport, Esq., of Erie, Pa., President of the Erie Car Works. The practical relation of his subject to railroad work is apparent from its title, 'Chilled Iron Car Wheels.' A short musical programme will precede the lecture."

"On Feb. 24, the celebrated lecturer, Wallace Bruce, Esq., will deliver his best lecture, 'Ready Wit.' We want to see a large audience out on that occasion. It will be well worth attending. Mr. Bruce's services were secured through the General Superintendent of the Central, Mr. J. M. Toucey."

"The coming convention of the Young Men's Christian Associations of this state, to be held at Utica, Feb. 17, to 20, promises to be of unusual interest. Mr. Theodore Voorhees, Assistant General Superintendent, who is Chairman of the Committee on Railroad Work for the State Association, will preside at the session devoted to that topic, and will make his annual report."

A Singular Accident.

A singular accident was reported last week in Virginia. A passenger train near Roanoke in that state was stopped on the track on account of a defect in the air brake. The entire crew left the train for the purpose of repairing the leak, leaving on board the passengers, the express messenger, the postal clerk and the newsboy. The brakeman was sent back to flag a freight that was coming in the rear. The freight soon made its appearance, and, not having been notified in time to stop on the heavy downward grade, plunged into the hindmost car of the passenger train, which was a Pullman, wrecking the greater part of it and badly injuring the rest of the train.

The concussion was so great that the throttle valve of the passenger engine was thrown wide open, and the train leaped forward with an impetus of over a mile a minute. So sudden was the start that the crew was unable to board the engine. The wildcat train ran at a high rate of speed until the steam was exhausted, when it came to a standstill about 15 miles from the place of the collision. During the flight the passengers were thrown about in their seats, and were almost wild with terror. Apprehending that some south-bound train might collide with the runaway after it had stopped, all the passengers left the cars and built fires in the fields to await the freight, which they thought would bring up the crew of their train. After the lapse of over an hour the rear train hove in sight, and the passenger engineer and fireman were soon at their places.

The brakeman who had been sent back to flag the freight no sooner saw that a collision was inevitable, than he struck for the woods and has not yet turned up. Several of the passengers received severe bruises, but no one was seriously injured by the collision. The crew of the runaway train has been ordered to Roanoke, where their conduct will be investigated by the officials of the road.

A Dangerous Grade Crossing.

At the hearing before the State Railroad Commissioners in Springfield, Mass., Jan. 31, on the petition for better station facilities, the following facts in reference to the amount of travel on Main street, which crosses the Boston & Albany main line close to the east end of the passenger station, were brought out:

Including the New York, New Haven & Hartford and the Connecticut River roads, 119 passenger trains leave or arrive at the depot daily. On Thursday, Jan. 27, in a period of 14½ hours, which covered the busy part of the day and evening, the gates at the Main street crossing were lowered to shut off the passage of teams and people 201 times. The aggregate amount of time which the thoroughfare was thus blocked was 170 minutes, or 2 hours and 50 minutes, or 20 per cent. of the time covered by the observations. The shortest period of closing the crossing was 15 seconds, and the longest 2 minutes and 15 seconds. The time taken for the passage of passengers and freight trains was 67 minutes; for the passage of cars in the process of making up trains, 23 minutes; for the shifting of freight cars, 23 minutes; for the passage of passenger engines (five times for the arrival and departure of each through train requiring a change of locomotives), 16 minutes; for passage outside the gates to the north track connecting with the Boston & Albany shops, 7 minutes; for general switching not included in the above analysis, 34 minutes.

On the following day another statistician found that between 6:30 a. m. and 8 p. m. the gates were closed to the passage of teams and people 3 hours and 1 minute in the aggregate, while 21 passenger and 31 freight trains passed and 109 "switching experiments" were carried on. The same man on Saturday, Jan. 29, watched the passage of 21 passenger trains, 20 freight trains and 101 switchings, which barred the progress of Hampden County citizens on foot and otherwise for two hours and 29½ minutes. Still another party noted that 2,035 teams crossed the tracks Friday, Jan. 31, between 6 a. m. and 6 p. m. Although the day was wet and stormy, 8,973 persons were counted passing between the gates in the same period. Thirteen hundred passed in the noon hour, to and from dinner. The Superintendent of the street railroad reported that 208 round trips are made daily, involving a crossing of the tracks at the depot 416 times.

A Vermont Accident Decision.

The Vermont Railroad Commission has published its first decision in an accident investigation, which is as follows:

"Fatal accident on the Central Vermont Railroad near Winoski Station, Jan. 1, 1887."

"The fatal accident to Hégessippe Bracq, on the Central Vermont Railroad, near Winoski station, was investigated by the Board of Railroad Commissioners on the 6th day of January. It appears that Mr. Bracq, with three companions, was returning to his home in Winoski from the city of Burlington, in the evening of Jan. 1, 1887, walking upon the track of the Central Vermont Railroad Co., when he was met by a passenger train going south. Mr. Bracq and his companions saw the train approaching and stepped aside to allow the same to pass. Through want of sufficient care and caution Mr. Bracq did not get to a safe distance, and losing his balance, or slipping, was struck by the tender of the engine, or the baggage car and instantly killed."

"The conclusion of this Board is, that it is dangerous for people to walk upon the railroad track."

"For the Board, HENRY L. CLARK, Commissioner."

Train Wrecking Burglars.

A dispatch from Allentown, Pa., says: "Burglars broke in the office of Dr. J. G. Hillegass, of Pennsylvania, and secured a safe weighing over 1,900 pounds, in which was a large sum of money and bonds and papers valued at over \$5,000. They loaded it upon a truck on the Perkiomen road and started south. Nearing McLean's station the whistle of a fast freight was heard approaching them on the same track. Not having time to unload the burglars deserted the truck and ran off. The night was very dark and the engineer did not see the obstruction until his engine struck it with great force. The truck was shattered to splinters and the safe thrown into

the ditch. The truck also contained a lot of bars, picks, etc., stolen from a tool house. Fortunately no serious damage was done to the train. The safe was returned to its owner."

Connecticut Grade Crossings.

A bill has been introduced in the Connecticut Legislature to abolish all the grade crossings in that state. The terms of the bill are: "Roads that have paid no dividend the year preceding the order to abolish the crossing shall bear the expense equally with the town, city or borough in which such crossing is situated. Roads that have paid 5 per cent. dividend shall pay three-fifths of the expense. Companies that have paid 5 per cent., but not more than 8, shall bear seven-tenths of the expense; and companies that have paid more than 8 per cent. shall pay four-fifths of the expense." There are 1,521 protected and unprotected grade crossings in the state, according to the last report of the Railroad Commissioners.

TECHNICAL.

Locomotive Building.

The Portland Co. in Portland, Me., has a contract for 12 locomotives for the Boston & Maine Road.

The report that the Baldwin Locomotive Works were to be removed from Philadelphia, which comes out every year about this time, has made its appearance and has been contradicted as usual. This time Cleveland, O., was the place.

The Mason Machine Works in Taunton, Mass., are building, for the Boston, Revere Beach & Lynn road, two 14 by 18 in. cylinder double bogie engines.

Brown, Howard & Co., of 20 Nassau street, New York, contractors for the Duluth, South Shore & Atlantic road, will soon let contracts for 50 locomotives.

The Taunton Locomotive Manufacturing Co. is building, for the Fitchburg road, 5 consolidation engines, 20 by 24 in. cylinders; 5 heavy moguls, cylinders 18 by 24 in., and one six-wheel switching engine.

The Boston & Lowell Co. is building one 18 by 24 cylinder passenger engine at the Charlestown shops.

The Atchison, Topeka & Santa Fe Co. will, it is said, shortly let contracts for 140 new locomotives for the extensions of its lines now in progress. All new locomotives for this road are to have the Ashton valve.

The Rhode Island Locomotive Works, in Providence, have just completed a passenger engine for the New York, Providence & Boston road to run the fast Shore Line trains. The engine has 18 by 24 in. cylinders and 6 ft. drivers; it will burn anthracite coal, and has a boiler 54 in. diameter of barrel, with a fire-box 10 ft. 5 in. long and 43 in. wide inside.

The Car Shops.

At a recent meeting of the directors of the Terre Haute Car Works, Jas. South was chosen President to succeed R. Cox, deceased; Lewis Cox, Vice-President and Treasurer; J. T. Scott, Secretary; Robert Cox, Superintendent.

Mr. W. C. Van Horne, now Vice-President and General Manager of the Canadian Pacific road, has become President of the Wells & French Co. in Chicago. Mr. O. W. Meyersburg, for many years in the railroad supply business in St. Louis and Chicago, is Vice-President and General Manager. Mr. H. L. Norton remains Secretary and Treasurer.

The Michigan Car Co. in Detroit, has taken an order for 500 box cars for the Grand Rapids & Indiana road.

The Washington Iron Works at Seattle, Wash. Ter., are to build some coal cars for the Seattle, Lake Shore & Eastern road.

The Wason Car & Foundry Co. in Chattanooga, Tenn., is building some flat cars for the Covington & Macon road.

The Wason Manufacturing Co. at Brightwood, Mass., has contracts for cars on hand which will keep the shops busy to their full capacity until Aug. 1 next. The machinery department is now running 12 hours a day.

The Laconia Car Co., Laconia, N. H., is building 5 passenger cars and 1 smoker for the Boston, Revere Beach & Lynn road. These cars will be equipped with the Eames vacuum brake, will have all the latest improvements, and will be finished in mahogany. They will be heated with hot water by a wrought-iron heater with which Mr. Coughlan, the Master Car-Builder of the road, has been experimenting, and which is his own device.

The Fitchburg Co. is building 12 new passenger coaches at the Charlestown shops; five of them are nearly finished.

The Michigan Car Co., of Detroit, is building some Wickes refrigerator cars for the Royal Danish railways. The cars are being built in sections, and will be taken apart when completed and shipped to Denmark.

Bridge Notes.

The Berlin Iron Bridge Co. at East Berlin, Conn., has the contract for a highway bridge at Colchester, Vt., over the Lamoille River.

The Wrought Iron Bridge Co. at Canton, O., has the contract for the north viaduct of the Grand avenue bridge in St. Louis.

The Mt. Vernon Bridge Co. at Mt. Vernon, O., has the contract for an iron bridge over the Cumberland River at Nashville, Tenn. The bridge will have one span of 250 ft., two of 200 ft. each and one of 80 ft., being 730 ft. long in all.

Manufacturing and Business.

The Wainwright Manufacturing Co., Boston and New York, report that during the month of January it sold between 1,800 and 1,900 H. P. of its exhaust feed-water heaters, shipping four to New York, two to Brooklyn, one to Tuckahoe, N. Y.; two to Swissvale, Pa., and one each to Pittsburgh, Pa.; Wilmington, Del.; Boston, Chelsea, Woburn, Leominster, Mass.; Keene, N. H., and Saco, Me. The company has also made large shipments of corrugated expansion joints to New England and the West, and is erecting a purifying plant on the premises of the Union Switch & Signal Co. at Swissvale, Pa.

The American Brake Co. in St. Louis is making extensive additions to its plant in the form of new tools and other facilities for turning out work.

Iron and Steel.

The Gadsden Furnace Co. has been organized, with \$300,000 capital stock, to build a blast furnace at Gadsden, Ala.

Mr. H. F. de Bardeleben and others are soon to begin building a rolling mill at Bessemer, Ala.

The Cleveland Rolling Mill Co. is about to add a new stack to its Central Furnace in Cleveland, O. The new furnace will have a capacity of 175 tons a day.

Pilot Knob Furnace in Iron County, Mo., has been leased to W. J. Rattle, of Cleveland, O., who will run it on Bessemer pig from Pilot Knob ore.

The Rail Market.

Steel Rails.—The market is steady and unchanged, with quotations at \$39@40 per ton at Eastern mills for standard sections.

Rail Fastenings.—The market is active, with spikes quoted at 2.60 cents per lb. in Pittsburgh; track-bolts, 3@3.25, and splice-bars 2.10@2.15 cents.

Old Rails.—Old iron rails are in demand, and are quoted at \$26@27 per ton at mill. Old steel rails are quoted at \$25@27 per ton in Pittsburgh, with very small supply.

New York Underground Lines.

A meeting for the purpose of reorganizing the New York Underground Railroad Co. was held at the office of the New York District Railroad Co. Some time since Edward Lauterbach and his associates bought \$1,500,000 worth of the stock of the Underground Co., and secured control of the corporation. Mr. Lauterbach was elected President of the company. The United States Subway Co. was awarded the contract for building the road, and was given a large representation in the new board of directors.

The new company will apply to the Board of Public Works to open the streets in order to proceed with the construction of the road.

The directors do not expect to meet any legal obstructions. Their charter, they say, gives them every right to build the road, and nearly all the property owners along the proposed route are in favor of it. The excavations will be 25 ft. wide and 15 ft. deep. A new patent automatic ventilating process will be used, which, it is claimed, is perfectly satisfactory. The proposed route is from Broadway, under City Hall Park to Brooklyn Bridge, thence up Centre street to City Hall Place, thence to Mulberry street, northerly to Bleecker street to Lafayette Place, under Lafayette Place to Astor Place, under Astor Place and Poole's Theatre to Fourth Avenue at the Stewart Building, thence north under Union Square to Broadway, up Broadway to Eighteenth street, thence to Madison avenue and under Madison avenue to the Harlem River.

A branch will run from Broadway and Eighteenth street to the southwest corner of Central Park, and another branch from City Hall Park to the Battery.

Steel Wheels.

The Dickson Manufacturing Co. has just closed a contract to furnish the Baltimore & Ohio Co. with the Boies (formerly the Dickson) steel wheel for the year 1887. The first order is for 500 wheels, 42 in. diameter, and has been given after a thorough test of the wheel.

The Boies wheel is now in use on 37 roads, and the company has orders ahead for over 1,000 wheels. The new shops, now about completed, will be able to make 25 wheels per day.

An Elevated Railroad in Chicago.

It is now stated that the Chicago Rapid Transit & Elevated Railroad Co. will soon be ready to begin the work of construction. The company was incorporated in November, 1885, with an authorized capital of \$19,000,000. The officers are as follows: President, James G. Smith, New York; Vice-President, H. J. Clough, Chicago; Treasurer, H. H. Nash, Chicago. The road will run south on State street, from Van Buren to Forty-third, thence east to an alley between Calumet and Prairie avenues, thence south to Sixty-third street, where it will make a jog half the length of Washington Park Club, and run on Charles street to Eighty-seventh. From that point a line will be run west to State street and south to Kensington, and another line will be run east to within ten blocks of the North Chicago Rolling Mills, and then on Commercial avenue to South Chicago. There will be 22 miles of railroad in all, with stations every half mile. The road will be built just over the cable line, the tracks being 18 ft. above the surface, supported by pillars 70 ft. apart, the whole construction being of steel. Mr. Frank Drake, Superintendent of Construction, says enough right of way has been secured to insure the building of the road, and that there is unlimited capital back of the enterprise.

Sight-Feed Lubricator Patent.

The suit of the Detroit Lubricator Co. against Frederick Lunkenheimer, of Cincinnati, for infringement of the Flower sight-feed lubricator patent, which has been pending in the United States Circuit Court at Detroit for nearly two years past, was brought to a final decision in favor of the defendant on Friday, Jan. 14, 1887. In the early stages of the suit the complainant was successful; the patent was held invalid and the defendant enjoined; but soon afterward the defendant discovered evidence which rendered the validity of the patent doubtful, and upon application to the Court the case was reopened, and leave given to take the newly discovered evidence. The case came on for a rehearing upon such evidence, and Judge Brown, who had rendered the former decision, held the evidence to show that Flower was not the first original inventor of the device claimed, and also that the invention had been in public use in this country for more than two years prior to his application for the patent, and for both reasons declared the patent to be invalid and void. On Friday, Jan. 14, the complainant was granted a re-argument of the case upon its merits before Judge Jackson, the United States Circuit Judge, and Judges Brown and Severens, United States District Judges, at the conclusion of which the former decision of Judge Brown was unanimously and emphatically sustained, and the patent again and finally declared void.

The counsel in the case were Wells W. Leggett and Geo. H. Lohr, of Detroit, and Judge Hodges, of New York, for complainant, and Peck & Rector, of Cincinnati, for defendant.

Car Couplers.

The McKen coupler is being fitted to 100 locomotives on the Lehigh Valley road. The link controller is found very convenient in enabling a coupling to be made with a common drawhead without risk of injury to the brakemen.

Natural Gas.

The last issue of the *American Manufacturer* contains an interesting illustrated article describing the safety appliances and reducing valve used by the Philadelphia Natural Gas Co. in Pittsburgh. These devices, the invention of Mr. George Westinghouse, recognize the fact that it is impossible to prevent some leakage in the large mains conveying the gas under the street. As any leakage is extremely dangerous both to life and property, and is liable to cause serious explosions and conflagrations, it is very important to either absolutely prevent any leakage or to find means to render the leakage harmless. Mr. Westinghouse decided on the latter as the only practicable course, and though the joints are made as tight as practicable by means of oakum and lead joints, an escape pipe is provided for each joint, so as to deal with any possible leakage, and lead it safely away.

Novel Water Supply.

A novel water supply is likely to be made use of shortly for the city of Bristol, England, in the shape of the water pumped daily from the Railroad Tunnel under the Severn River, which amounts to several million gallons, and is of admirable quality as it comes from a land spring.

Instrument for Shading Drawings.

The Franklin Institute has awarded the Elliot Cresson Medal to an air-brush which enables a drawing to be shaded in a few minutes, the saving of time over the old method of laying on and softening repeated washes of color being enormous. The execution is also very good.

The manner in which the air-brush delivers the color to the paper may be thus described: The artist supplies liquid color from a brush to a spoon-like reservoir. Through this liquid a fine needle darts rapidly back and forth, its wetted point being carried forward beyond the edge of the spoon. A strong current of air blown against the point of this needle

carries off the small amount of color adhering to it in finely divided particles, thin and fine at the point of departure, but widening out as its distance increases. Hence, if the instrument is held near the paper, it will make fine lines, when moved as in writing, but, removed to a distance, it will make broad, soft tints, with gentle blendings. The greater or less length of stroke of the needle, as well as the current of compressed air playing on it, is always completely under the control of the artist by action of his thumb while working. The supply of air to the chamber being pumped in by action of his foot.

A New Roofing Material.

The Ajax Metal Co., of Philadelphia, have, after prolonged experiments, completed a new process for coating iron and other metals with an adhesive lead coating. A molten metal bath is used as in galvanizing, but lead is substituted for zinc. It is claimed that by the use of this process, railroads can be furnished with sheet-iron coated with pure lead, and that this material will last indefinitely and form an admirable roofing for car and machine shops, etc. The lead coating is practically indestructible, as it resists all alkalis and all acids with the exception of nitric acid. The cost will not be greater than that of galvanized iron.

It is proposed to coat all metallic surfaces, such as wire, sheet metal, pipe, wrought iron and malleable iron fittings, in fact, everything in the line that is exposed to the weather or acids.

A very brisk demand for this new product is anticipated when the plant is in full working order.

Quick Mechanical Work.

When the steamship Alaska arrived in this port it was discovered that the piston was cracked; it was also evident that the return trip to Europe could not be made with the piston in this condition. The piston was 100 inches in diameter and 16 inches deep. On Tuesday evening, January 18, an order for a new piston was sent to the Delamater Iron Works, New York. At 7 o'clock of the same evening, men from these works took measurements of the piston on board of the ship. At 7 o'clock of the following morning the sweeps for the piston were sent to the foundry, and it was cast on Friday evening at 5 o'clock. During Saturday the casting was allowed to cool. On Sunday morning at 7 o'clock the piston was placed in the boring mill, and Monday evening at 6:30 o'clock it was turned drilled, completely and successfully finished. At 9 o'clock of the same evening the piston was in the cylinder with all the nuts screwed down, and the job was finished. On the following morning, Tuesday, 25th of January, at 5 o'clock the ship started for Europe with a new piston weighing 13,000 pounds. Considering the size and weight of piston, and also, remembering that no pattern for the same was on hand, it must be admitted that this piston was very quickly cast and finished.—*American Machinist*.

Ship Building.

The Harlan & Hollingsworth Co., of Wilmington, Del., launched on Jan. 29 a new iron steamer for the Albany Day line.

The vessel is 15 ft. longer and 3 in. larger cylinders than the largest boat at present on the line. The name of the new boat is not yet decided upon, but her principal dimensions are as follows:

Length of hull perpendiculars	500 ft.
Beam	40 ft.
Length over all on deck	515 ft.
Beam	75 ft.
Draft of water, loaded	6 ft.
Diameter of wheels	36 ft. 2 in.
Feathering floats, each	12 ft. 6 in. by 44 in.
Diameter of shaft	22 in.
Diameter of cylinder	75 in.
Stroke	12 ft.
Boiler pressure	60 lbs.
Indicated horse-power (estimated)	4,000

The three steel boilers are of the cylindrical return flue type. The vessel is calculated to carry 1,500 passengers upon ordinary occasions, but it would be possible on an emergency to convey 3,500.

Economy in Firing Up Anthracite-Burning Locomotives.

C. G. Steffe, of Reading, Traveling Engineer of the Philadelphia & Reading Railroad Co., has brought to a successful conclusion a series of experiments for retaining the fires in the large locomotives of the company instead of drawing them at the end of each trip. The firemen now sprinkle their fires with a quantity of soft coal or coke, whereby the fires are kept in good shape until the engines are needed. Heretofore, it has been necessary to keep a large quantity of wood on hand, and a number of men were employed in looking after the fires. The new mode will be put in force at once on the main line of the Reading Railroad and branches, and it is estimated that the change will effect a saving of many thousands of dollars annually.—*Exchange*.

The Advantages of Triple Expansion.

All the steamers of the Union line running between England and the Cape of Good Hope are being fitted with new steel boilers working at 160 lbs. per sq. in. The original compound engines, by the addition of another cylinder, are thus made triple-compound. The Athenian is the last vessel so altered. The diameters of the new cylinders are 36, 58 and 94 in. respectively, and the length of stroke 54 in. On the official trial trip she attained a mean speed of 14.73 knots per hour, and indicated 4,606 H. P., her engines working at 70 revolutions per minute, with a steam pressure of 160 lbs. to the sq. in. This shows an increase in speed of 1 1/2 knots per hour and an addition 1,400 indicated horse-power, as compared with the Athenian's original trial trip with ordinary compound engines. The adoption of the triple expansion engines will add greatly to the comfort of passengers through the decreased vibration, while the economized consumption of coal will be advantageous to the proprietors. The Spartan, which vessel's engines were similarly converted a few months ago, has just returned to England from her first voyage with the triple expansion engines, and the results have been very satisfactory.

Indian Railways.

The net receipts on the Railways in India for 1885-86 show an increase as compared with those of 1884 of nearly 12,000,000 rupees, equal to about \$4,200,000. The percentage on the capital expenditure, excluding, as is usually done, that on steamboat services, suspense items, and indirect charges, gives a return equivalent to 5.84 per cent., against 5.27 per cent. in the previous year. The summary of merchandise carried on the several Indian railways supports the favorable view of the general traffic taken in last year's report. The total tonnage has increased by 1,867,378 tons, or nearly 15 per cent.; and thirty-nine out of the forty-seven items tabulated show increases, the most marked being that of "grains and pulses," with a rise of 1,159,886 tons.

Pullman Cars and Janney Couplers Abroad.

It is always a grateful task to chronicle the success of American inventions abroad, and therefore, we note the following paragraphs in the *London Engineer* with much satisfaction. The Pullman cars referred to are parlor cars, the

line to Brighton, like that to Long Branch, being too short for sleeping cars.

"The success of the Pullman cars on the Brighton line has been such that the directors have entered into a contract with the Pullman Company for a further term of ten years.

"The Brazil Great Southern Railway, having obtained satisfactory results in Brazil with two wagons fitted with the Janney coupling, has requested, through Mr. A. Rumtall, the Lancaster Wagon Company to supply this coupling to all the stock now being manufactured by that firm for the company."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Delaware, Lackawanna & Western, annual meeting, at the office in New York, Feb. 21.

Missouri Pacific, annual meeting, at the office in St. Louis, March 8.

Peoria, Decatur & Evansville, annual meeting at the office in Peoria, Ill., March 1.

Providence & Worcester, annual meeting, at the office in Providence, R. I., on Feb. 7.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago & Alton, 2 per cent., quarterly, payable March 1.

Chicago & Eastern Illinois 3 per cent., semi-annual, payable March 1.

Cincinnati, Hamilton & Dayton, 2 per cent., quarterly, payable Feb. 1.

Detroit, Lansing & Northern, 3 1/2 per cent., semi-annual, on the preferred stock and 3 per cent., yearly, on the common stock, both payable Feb. 15, to stockholders of record on Feb. 1.

Danbury & Norwalk (leased to Housatonic Co.), 2 1/2 per cent., semi-annual, payable Feb. 15.

Maine Central, 3 per cent., semi-annual, payable Feb. 15.

New York, Providence & Boston, 2 1/2 per cent., semi-annual, payable Feb. 10.

Foreclosure Sales.

The Little Rock, Mississippi River & Texas road was re-sold in Little Rock, Jan. 28, in pursuance of the orders of the court, and was bought for \$1,500,000 by Jay Gould, who now owns a large part of the bonds.

Transportation in Congress.

The Senate on Jan. 28 further discussed the bill to prohibit senators from acting as attorneys for railroad and other corporations, but took no action.

The Senate Committee has reported favorably on the bill to authorize the Minneapolis, Sault Ste. Marie & Atlantic Co. to bridge the Ste. Marie River at the Sault. The bridge is to be open to all railroads on equitable terms.

The House on Jan. 28 passed the bill authorizing the building of cable railroads in a number of the streets in Washington.

General Baggage Agents' Association.

This Association held its half-yearly meeting in Atlanta, Ga., Jan. 19. The matter of transportation of sample trunks containing valuable jewelry was discussed, but no action was taken. A committee was appointed to recommend a uniform standard for weight of baggage to be allowed free with one ticket.

The reports made showed that the territory of the Association is increasing. During the past year almost all the old styles of baggage checks have been retired, and the limit of personal baggage is being generally enforced.

After electing officers, it was decided to hold the summer meeting in Denver, Col., on the third Wednesday in July. After the meeting, the members of the Association made an excursion to Florida, on invitation of the East Tennessee, Virginia & Georgia road.

The Omaha Railroad Club.

A new railroad club has been organized at Omaha among the officials of the Union Pacific. A committee has been appointed to draft a set of by laws which will be submitted for adoption at the next meeting, which will be held in the office of Mr. C. N. Pratt, Storekeeper, at 4 p. m. on the first Saturday in February. Messrs. Crandall, Pratt, Litcherberg, Munford and Ledley comprise the committee, and Mr. G. T. Crandall was chosen Secretary.

Executive Committee of the Master Car-Builders' Association.

A meeting of the executive committee of the Master Car-builders' Association was held Jan. 26 at the Tift House, Buffalo. There were present: B. K. Verbruyck (Chicago, Rock Island & Pacific), President of the Association; F. D. Adams (Boston & Albany); John Kirby (Lake Shore & Michigan Southern); R. C. Blackall (Delaware & Hudson); John S. Lentz (Lehigh Valley); and J. W. Cloud (Pennsylvania). The proceedings were, as usual, strictly private.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—A circular announces that from Feb. 1 the officers of the Atlantic & Pacific and the California Southern roads will report to the First Vice-President and General Manager of this company. The management of this company is thus extended formally over its controlled lines.

Mr. Herbert Hackney is appointed Assistant Superintendent of Machinery, with office at Topeka, Kan. He is a son of Mr. George Hackney and is a mechanic of good standing, having received a thorough training under his father.

Atlantic & Pacific.—From Feb. 1 the officers of this road will report to the First Vice-President and General Manager of the Atchison, Topeka & Santa Fe.

Mr. T. R. Gabel, Acting General Superintendent, having resigned, Mr. George L. Sands is appointed Superintendent, with office at Albuquerque, N. M. Mr. George Hackney is appointed Superintendent of Machinery, with office at Topeka, Kan., and Mr. A. C. Armstrong Purchasing Agent, with office at Topeka, Kan. Messrs. Hackney and Armstrong hold the same positions on the Atchison, Topeka & Santa Fe.

Boston & Albany.—Mr. Edward I. Sackett has been appointed Division Superintendent of this company, vice Charles E. Grover, deceased.

California Southern.—Mr. George Hackney is appointed Superintendent of Machinery, with office at Topeka, Kan. He holds the same position on the Atchison, Topeka & Santa Fe.

Central, of Georgia.—Mr. William Rogers, for a number of years General Superintendent, has been appointed assistant to the President. Mr. Morris S. Belknap succeeds Mr. Rogers as General Superintendent. Mr. Belknap has been

for some time Superintendent of the Vicksburg & Meridian and the Vicksburg, Shreveport & Pacific roads.

Central Railroad Club.—This Club has elected officers as follows: President, R. H. Soule, Buffalo; Vice-President, T. Sullivan, St. Thomas, Ont.; Secretary and Treasurer, E. Chamberlain, Buffalo; Executive and Financial Committee, R. H. Soule, E. Chamberlain, W. F. Turroff, F. B. Griffith, John Kirby, R. C. Blackall.

Chicago & Eastern Illinois.—Mr. F. A. Peters, of Boston, has been chosen a director in place of John U. Brookman, resigned.

Chicago, Oquawka & Kansas City.—The directors are: J. S. Thompson, Chicago; V. M. Blanding, Porter Skinner, H. P. Hull, Rock Island; James Harlan, Mount Pleasant, Ia. Chicago is the headquarters.

Cincinnati, New Orleans & Texas Pacific.—Mr. Albert B. Wrenn, who has been Northern Passenger Agent of the East Tennessee, Virginia & Georgia, with headquarters at Cincinnati, has been appointed District Passenger Agent of this road, with headquarters at Louisville, Ky. General Passenger Agent Colburn announces the following appointments at Louisville, Ky.: W. H. Newman, General Agent; G. H. Asper, Assistant General Agent.

Delaware & Hudson Canal Co.—Mr. T. M. Williamson, Trainmaster of the Saratoga and Champlain divisions, will hereafter have the title of Assistant Superintendent. Mr. P. H. Connors, Trainmaster of the Susquehanna Division, will also be known as Assistant Superintendent hereafter.

Drummond & Phillipsburg.—The following have been elected officers of this new Montana company: President, S. T. Hauser; Vice-President, A. B. Hammond; Treasurer, F. L. Worden; Secretary, A. B. Hammond; Chief Engineer, Gen. Anna Anderson; Assistant Secretary and Treasurer, Harvey Barbour.

Eel River & Eureka.—The stockholders of this California company have elected the following officers: President, John Vance; Vice-President, Wm. Carson; Secretary, W. S. Riddell; Treasurer, Stephen Hill; directors, John Vance, Wm. Carson, W. S. Riddell, Stephen Hill, W. J. Sweeney, Richard Sweeney, C. L. Rose; Superintendent, James Rogers.

Fort Wayne & Jackson.—This company, whose road is leased to the Lake Shore & Michigan Southern, last week re-elected the old directors.

Galveston, Sabine & St. Louis.—At the annual meeting in Longview, Tex., Jan. 24, the following directors were chosen: Nelson S. Easton, Charles M. Whitney, Frank M. Larchar, Richard J. Evans, James M. Moberly, I. H. Crutcher, Thomas F. Hull, George D. Harrison, Andrew S. Taylor. The board elected officers as follows: President, Nelson S. Easton, 66 Broadway, New York; Vice-President and General Manager, Richard J. Evans, Longview, Tex.; Secretary and Treasurer, Edwin S. Larchar, 96 Broadway, New York.

General Baggage Agents' Association.—At the convention in Atlanta, Ga., Jan. 19, the following officers were elected: President, E. A. Sadd, Chicago; Burlington & Quincy; Vice-President, D. M. Christie, Chicago; Milwaukee & St. Paul; Secretary and Treasurer, J. E. Quick, Chicago & Grand Trunk.

Hudson Connecting.—The directors of this new company are: Arthur Breck, S. A. Caldwell, Simon Cameron, W. T. Carter, Henry C. Gibson, Charles Henry Hart, Henry McCormick, Morton McMichael, A. M. Moore, H. Blake Tyler, Philadelphia; J. Coleman Drayton, David Palen, W. Van Benthuyssen, New York.

Kansas, Nebraska & Dakota.—At the annual meeting in Fort Scott, Kan., Jan. 19, directors were elected as follows: John Keller, Alexander McGaw, A. P. Boller, Henry Bumgardner, M. Vanhollinger, L. L. Levy, N. H. Norris, John Perry, A. A. Harris, John Francis, J. G. Stonecker. The following officers were chosen for the ensuing year: John Keller, President, Lancaster, Pa.; Vice-President and General Manager, L. L. Bush, Topeka, Kan.; Treasurer, Alexander McGaw, Philadelphia, Pa.; Secretary, M. Vanhollinger; Auditor, H. W. Bush.

Massillon & Cleveland.—At the annual meeting at Massillon, O., Feb. 1, these directors were elected: L. H. Meyer, C. W. Casa, J. N. McCullough, John J. Haley, John Sherman, P. G. Albright, J. F. Card. The officers are: President, Louis H. Meyer, New York; Secretary and Treasurer, John J. Haley, Pittsburgh, Pa.

Mexican Central.—The following organization of the traffic department has taken effect: Mr. A. C. Michaelis, General Freight and Passenger Agent, with headquarters at the City of Mexico, will have direct charge of the traffic department, reporting to the General Manager. Mr. Geo. W. Keeler will continue as General Eastern Agent, with office at 261 Broadway, New York, and report to the General Freight and Passenger Agent.

Michigan Passenger Agents' Association.—At the annual meeting in Grand Rapids, Mich., Jan. 20, the following officers were elected: President, W. A. Carpenter; Vice-President, C. L. Lockwood; Secretary, George E. King.

Missisquoi Valley.—Mr. T. M. Deal has been appointed Superintendent. The general freight and passenger department will remain under his supervision as formerly, and all communications connected therewith should be addressed to him as above.

Natchez, Jackson & Columbus.—At the annual meeting in Natchez, Miss., Jan. 18, these directors were elected: W. T. Martin, Rufus F. Learned, George W. Koontz, T. Otis Baker, John C. Schwartz, Jos. N. Carpenter, Jas. W. Lambert, R. L. Bogle, Thos. T. Hart, Stephen E. Rumble, Jas. Surget, Geo. M. Brown, and Louis Botto. Officers were chosen as follows: William T. Martin, President; John C. Schwartz, Vice-President; Jos. M. Kerns, Secretary; Geo. W. Koontz, Treasurer.

Nevada & California.—This company, which owns a narrow gauge road from Reno, Nev., into California, has been reorganized with the following corporators: C. Comyn Moran, A. D. Moran, New York, and E. L. Heriot, A. D. Manning, W. O. H. Martin, S. D. King, R. H. Heriot, George Taylor, John Sumpter, Reno, Nev. Messrs. Chas. Moran, D. C. Moran, E. L. Heriot, S. D. King and R. N. Heriot were chosen as directors.

New Albany & Eastern.—The officers are: President, John McLeod; Secretary, A. Culbertson. Office in New Albany, Indiana.

New London Northern.—Mr. J. A. Allen has been appointed Assistant General Freight Agent, and will, in addition to his present duties as Agent at New London station, have general charge of freight transportation and traffic, except in matters pertaining to rates and claims.

Newark, Somerset & Stratsville.—This company, whose road is leased to the Baltimore & Ohio, has elected Orland Smith President; J. Hope Suter, Secretary and Treasurer.

New York, Lake Erie & Western.—Mr. George De Haven has been appointed Assistant General Passenger Agent. He was recently on the Pennsylvania.

New York & New England.—Mr. A. A. Jackson is appointed Assistant to the Vice President. He was recently on the Allegheny Valley road.

New York Underground.—Col. Calvin Goddard is Treasurer and L. H. Rullman, Secretary. Office, No. 40 Wall street, New York.

Ocean Steamship Co.—This company, which is controlled by the Central Railroad Co. of Georgia, has elected officers as follows: President, E. P. Alexander, Savannah, Ga.; Directors, C. H. Phinizy, Augusta, Ga.; W. S. Chisholm, E. M. Green, J. J. Wilder, Savannah, Ga. Gen. Alexander succeeds Mr. W. G. Raoul as President.

Pennigewasset Valley.—Mr. Samuel N. Bell has been chosen President in place of J. Thomas Vose, deceased.

Poughkeepsie Connecting.—The directors of this new company are: J. Coleman Drayton, David Palen, W. Van Benthuyssen, New York; Arthur Breck, W. T. Carter, S. A. Caldwell, Simon Cameron, Henry C. Gibson, Charles Henry Hart, Henry McCormick, Morton McMichael, A. M. Moore, H. B. Tyler, Philadelphia.

Sacramento Valley & Humboldt Bay.—The directors are: G. B. Krutmeier, T. M. Lindeman, H. B. Keesing, Isaac Strassburger, San Francisco; J. S. Buris, London.

St. Cloud, Duluth & Ortonville.—The directors are: J. P. Wilson, J. E. Hayward, Clarence L. Atwood, St. Cloud, Minn.; E. Cross, Sank Rapids, Minn.; S. N. Van Cleve, Minneapolis, Minn.

St. Louis, Arkansas & Texas.—The following order from President S. W. Fordyce is dated St. Louis, Feb. 1: "Mr. H. G. Allis, in addition to his duties as Comptroller, is this day appointed Assistant to the President."

St. Louis & Missouri Central.—The directors of this company as consolidated are: J. T. K. Haywood, Lewis C. Nelson, George W. Parker, John D. Perry, George I. Post, St. Louis; R. P. Williams, Fayette, Mo.; J. H. Waugh, Columbia, Mo.; J. S. Watson, Fulton, Mo.; John H. Garth, Hannibal, Mo.; H. R. Finney, Alton, Ill.; Stevenson Burke, Cleveland, O.; Frank C. Holland, D. M. Henderson, New York. The board has elected John D. Perry President; George W. Parker, Vice-President.

Union Pacific.—Mr. C. Phillips has been appointed General Agent at Portland, Ore., in charge of both freight and passenger business. Appointment takes effect Feb. 1.

Wabash, St. Louis & Pacific.—Receiver Cooley has appointed Mr. M. L. Dougherty Commercial Agent at St. Louis. Mr. Dougherty is at present Joint Agent of the Central Traffic Association at Indianapolis.

Wilkes-Barre & Western.—At the annual meeting in Wat-soutown, Pa., Jan. 21, Mr. R. T. McCabe was chosen President, and Morris Liveright, W. C. Dearmond, Jacob Gump, F. H. Kingsbury, W. R. Heath, S. H. Hicks, T. S. Moorhead and H. G. Cobill were elected directors.

Worcester & Hudson.—This company has been organized at Worcester, Mass., with the following officers: President, John Gilman; Vice-President, Luman T. Jeffs; directors, Henry T. Pratt, Jerome Marble, Wm. H. Drury, Thomas Rice, Thomas Harlow, H. A. Cook, E. W. Chapin, John P. Flagg, Edmund M. Stone, Henry Tower.

PERSONAL.

—Mr. T. R. Gabel has resigned his position as Acting General Superintendent of the Atlantic & Pacific road.

—Mr. W. H. Firth has resigned his position as General Southwestern Passenger Agent of the Hannibal & St. Joseph and the Kansas City, St. Joseph & Council Bluffs roads.

—Mr. R. R. Kincaid, Assistant General Council of the Toledo & Ohio Central Co., has resigned that office to take a position with the Duluth, South Shore & Atlantic.

—Mr. C. W. Barnes, General Western Agent at Chicago for the Railway Car Association, has resigned that position, to date from Feb. 1.

—Mr. Royal B. Jennings, for many years Treasurer of the Chicago, Milwaukee & St. Paul Co., died at St. Augustine, Fla., Feb. 1, aged 70 years. His death was caused by paralysis.

—It is reported that Mr. D. H. Blackham will resign his position as Superintendent of the Susquehanna Division of the New York, Lake Erie & Western road on account of ill health.

—It is reported that Col. Henry Fink has been offered the position of General Manager of all the lines controlled by the Richmond & West Point Terminal Co. He has not yet accepted.

—Gen. E. P. Alexander, lately chosen President of the Central Railroad Co. of Georgia, has resigned his position as a government director of the Union Pacific.

—Mr. Wm. Scott Gerrish, who died in New York, Jan. 29, was formerly a civil engineer, and 30 years ago was Assistant Engineer of the Erie road. For 24 years past he had held a position in the Custom House at New York.

—Mr. George De Haven having resigned his office as Passenger Agent for the Pennsylvania Railroad at Baltimore, to accept a position on the Erie, his friends in Baltimore last week presented him with a valuable watch and chain.

—Mr. R. E. Hardaway, for some time past Chief Engineer of the Americus, Preston & Lumpkin road, has resigned that position and will reside in Tuscaloosa, Ala., for the present.

—Mr. A. A. Jackson has resigned his office as Superintendent of the Low Grade Division of the Allegheny Valley road to accept a position on the New York & New England. Before leaving, Mr. Jackson was entertained at a dinner given in his honor at Brookville, Pa., and was then presented with a valuable silver set by the employes of his old road. He also received a very earnest letter from the engineers and firemen, testifying their esteem and their regret at his departure.

—Mr. C. C. Wrenshall, who has been with the Northern Pacific since the opening through of that line as Engineer of Maintenance of Way, has resigned his position to enter the service of the Woodstock Iron & Steel Co., at Anniston, Ala., as Superintendent of Construction, in building a new line of railroad from Anniston to Gadsden, Ala., and also some new furnaces on the line. After the completion of construction Mr. Wrenshall will remain with the Woodstock Co. as Superintendent. His connection with the Northern Pacific closes April 1 next.

—Mr. Daniel M. Kendrick, General Passenger Agent of the New York Central & Hudson River road, died of consumption at Thomasville, Ga., Jan. 26, aged 40 years. He had been sick for some months past, and went South late in December in the hope of benefiting his health. Mr. Kendrick was born at Cambridge, Mass., Sept. 1, 1846. He entered railroad service in 1872 on the Paris & Decatur, where he remained until May 1, 1877. Up to 1875 he was a clerk in the Auditor's office, and for the remainder of the period named he was General Passenger and Ticket Agent. From June 1, 1877, to Jan. 1 of the following year, he held the position of Southwestern Passenger Agent of the Cleveland, Columbus, Cincinnati & Indianapolis and the Indianapolis & St. Louis. He then became the General Western Passenger Agent of these roads and continued so until Feb. 3, 1880, when he was appointed General Passenger Agent of the Indianapolis & St. Louis. Thereafter he became the General Passenger and Ticket Agent of the Delaware & Hudson, and upon the death of C. B. Meeker he was appointed to the position thus made vacant on the New York Central, and which he held down to the present time.

TRAFFIC AND EARNINGS.

Chicago Shipments Eastward.

The Board of Trade reports east-bound shipments from Chicago for the week ending Jan. 29 as follows:

	Tons.	P.c.		Tons.	P.c.
Chi. & Gr. Trunk	8,605	15.2	Pitta. Ft. W. & C.	8,881	16.0
Mich. Central	5,062	11.6	Chi. St. L. & Pitts.	3,707	6.5
Lake Shore	10,153	23.4	Balt. & Ohio	2,294	5.3
N. Y., Chi. & St. L.	5,466	12.6	C. Ind., St. L. & C.	3,228	7.4

The statement includes local as well as through shipments. The total for the week was 43,396 tons, being an increase of 6,424 tons, or 17.4 per cent., as compared with the preceding week.

Shipments for eight weeks past by these reports have been, in tons:

	Week ending
Dec. 11, Dec. 18, Dec. 25, Jan. 1, Jan. 8, Jan. 15, Jan. 22, Jan. 29,	45,238 48,080 63,133 44,292 37,520 44,017 36,972 43,396

Shipments include dead freight only. The shipments by the Chicago & Atlantic are not reported, and are not included in the tonnage given.

Theatrical Tickets.

George H. Daniels, Assistant Commissioner of the Central Traffic Association, Passenger Department, has issued a special circular to members of the association, requesting a vote on the theatrical rule, in which he says:

"In order to have our joint rules conform to this action of the trunk lines, it will be necessary to amend rule 8 to make it read as follows:

"No passes or free tickets shall be issued to any person in any way connected with theatrical companies, and no tickets for single individuals shall be issued at theatrical rates, whether to advance agents, managers, bill-distributors, or other parties. It is, however, agreed that nothing in this rule shall prevent the stamping of a single ticket sold at full rates with the word theatrical, in order to identify theatrical passengers to baggage agents."

"I beg to say that the rule permitting the sale of single theatrical tickets to trunk line points has, in my opinion, been greatly abused, and I trust you will be willing to vote for the amendment of joint rule 8, as suggested above, to make it conform to the action of the trunk lines, thus cutting off one more abuse. Kindly give me your vote at your earliest convenience and oblige, so that if the amendment is carried all lines can have notice before Feb. 1 that it will take effect on that date."

Probable Rate War.

It is alleged that the competition of the Chicago & North-western, and the Chicago, Milwaukee & St. Paul roads for Kansas traffic, by way of Omaha and the Marysville cut-off of the Union Pacific, thus severely cutting into the business of the lines in the Southwestern Railway Association, will be likely to result in a serious war of rates on all western freight business.

Differentials in Passenger Fares.

Arbitrator Samuel Stevenson has rendered his decision upon the questions submitted to him at the January meeting of the passenger department of the Central Traffic Association. He refuses to allow the claim of the Louisville & Nashville road for a difference against the Ohio & Mississippi on business from Louisville to Eastern points via the Bee Line, New York, Pennsylvania & Ohio, and Baltimore & Ohio roads. He also rules against the claim of Lake Erie & Western road for as low a rate from St. Louis, via the Chicago & Alton and Bloomington, as is granted to any other line out of St. Louis. He allows the New York, Pennsylvania & Ohio a difference of \$1.50 first-class from Cincinnati to New York, but disallows its claim of \$1 for second-class. The claim of the Michigan Central and the Lake Shore & Michigan Southern for the same rate to Boston and New England points, via their own lines and the Rome, Watertown & Ogdensburg, as is granted the Chicago & Grand Trunk, was not allowed.

St. Paul and Minneapolis Rates.

At a special meeting of the Local Passenger Association at St. Paul on Jan. 31, the following resolution was unanimously adopted:

"Resolved, That in view of the fact that the St. Paul, Minneapolis & Manitoba Railway, through its agent, has declined to become a member of our Association, and has issued independent rates—cut rates—to points reached by lines in this Association, it is the request of this Association that eastern lines and rate associations shall decline to recognize any rate quoted by the Manitoba Railway less than rates named in the St. Paul and Minneapolis joint rate sheet, and that they further decline to use any local rates quoted by the said road which may have the effect of cutting rates to common points or competitive territory."

Southwestern Railway Association.

Commissioner Midgley, of the Southwestern Railway Association, in a letter to the general managers, says:

"It is desirable that at an early date a general meeting of the Southwestern Railway Association be held to determine the plan of action to be pursued in view of the passage of the interstate commerce bill. In order that, on assembling we may have something definite to consider, it has been suggested and agreed that representatives of each road shall come prepared to propound such practical questions as are likely to arise under a strict conformity with the law. As the main purpose is to get at what the law actually admits of common carriers doing, in order that we may then decide what to do, the question had better be arranged in divisions somewhat as follows:

"What form of combination can be most effectually maintained, and what methods of enforcing such agreement is it expedient to adopt?"

"How shall rates on competitive business be made, and what relation shall they sustain to local charges on the proportions received on long distance business carried over two or more roads?"

"In what manner shall schedules of rates be issued, and all these publications by the associations, and exposing them for public inspection fulfill the law's requirements? What else

circumstances, if any, would justify making rates different from those named in regular tariff, and, when made, what publication thereof is required?

"Constructions.—How shall the phrase, 'under substantially similar circumstances and conditions,' be regarded as authorizing carriers in special cases to charge more for a longer than a shorter haul? Does the competition via Missouri River boats or routes to the southeast or the Gulf come within the latitude implied in the above phrase?

"What arrangement should be made for a construction of the law by the Commissioner?"

Mr. Midgley suggested that the proposed meeting be held on Feb. 8, but some of the managers could not attend on that date. The meeting will probably be held some time before the middle of the month.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Month of January:	1887.	1886.	Inc. or Dec.	P. c.
Denver & R. G.	\$541,382	\$405,952	I. \$135,430	33.3
Long Island	158,854	153,033	I. 5,821	3.8
Mil., L. S. & W.	131,877	94,015	I. 37,862	39.1

Year to Dec. 31:	1886.	1885.	Inc. or Dec.	P. c.
Camden & Atl.	\$590,000	\$561,346	I. \$28,654	5.1
Net earnings	120,775	134,143	D. 13,368	3.2
Dan. & Norwalk	226,035	224,870	I. 1,165	4.9
Det., Lan. & No.	1,226,536	1,228,471	D. 1,935	0.2
Net earnings	498,717	457,300	I. 41,417	9.1
Georgia Pacific	845,926	674,306	I. 171,620	25.4
Mem. & Charles	1,444,638	1,339,849	I. 104,789	7.8
Net earnings	448,212	301,384	I. 146,828	48.8
Mexican Central	3,853,425	3,556,561	I. 296,864	8.3
Net earnings	1,401,651	1,598,461	D. 124,810	8.2
N. Y., L. E. & W.	18,712,428	16,045,373	I. 2,667,055	16.6
Net earnings	3,957,595	3,446,093	I. 511,502	14.8
N. Y., P. & Ohio	1,423,678	1,197,684	I. 225,994	18.8
Net earnings	630,838	5,167,177	I. 1,141,761	22.1
N. Y., Sus. & W.	1,129,440	1,092,355	I. 37,085	3.4
Net earnings	491,778	504,914	D. 13,136	2.6
Norfolk & West.	3,252,056	2,771,121	I. 480,935	17.0
Net earnings	1,291,147	1,121,829	I. 169,318	15.0
Pennsylvania	50,379,070	45,615,027	I. 4,764,043	10.3
Net earnings	17,759,482	16,135,269	I. 1,624,213	10.1
South Carolina	1,120,000	1,151,841	D. 31,781	2.7
West Jersey	1,352,458	1,286,012	I. 66,446	5.2
Net earnings	503,274	470,617	I. 32,657	6.9

Eleven months to Nov. 30:	1886.	1885.	Inc. or Dec.	P. c.
Peoria, Dec. & E.	\$736,792	\$674,642	I. \$62,150	9.2
Net earnings	375,350	302,505	I. 72,845	24.0

Month of November:	1886.	1885.	Inc. or Dec.	P. c.
Peoria, Dec. & E.	\$64,130	\$64,262	D. 132	0.4
Net earnings	33,131	31,277	I. 1,854	5.9

Month of December:	1886.	1885.	Inc. or Dec.	P. c.
Camden & Atl.	\$29,506	\$28,219	I. \$1,287	4.9
Net earnings	\$8,257	\$10,268	D. 2,011	9.5
Can. H. & Day	255,498	258,090	D. 2,592	1.0
Net earnings	100,204	101,826	D. 1,622	1.6
Dan. & Norwalk	17,311	16,693	I. 618	3.7
Georgia Pacific	98,409	76,344	I. 22,065	28.4
Mem. & Charles	177,797	158,934	I. 18,863	11.8
Net earnings	35,297	29,470	I. 5,827	19.7
Mexican Central	456,700	346,997	I. 109,703	31.3
Net earnings	228,950	173,487	I. 55,463	32.1
N. Y., L. E. & W.	1,582,508	1,505,885	I. 76,623	5.1
Net earnings	514,858	491,587	I. 23,271	4.7
N. Y., P. & Ohio	320,786	309,179	I. 11,607	3.8
Net earnings	97,887	67,958	I. 29,929	43.7
N. Y., Sus. & W.	591,966	529,709	I. 62,257	9.7
Net earnings	224,318	198,480	I. 25,838	12.9
N. Y., Sus. & W.	112,545	86,405	I. 26,140	30.4
Net earnings	56,958	38,110	I. 18,848	49.4
Norfolk & West.	267,317	249,428	I. 17,889	7.0
Net earnings	93,059	109,845	D. 16,786	15.0
Pennsylvania	4,428,216	4,046,682	I. 381,534	9.4
Net earnings	1,398,182	1,359,201	I. 38,981	2.9
South Carolina	87,420	122,500	D. 35,080	29.4
West Jersey	83,568	86,803	D. 3,235	3.8
Net earnings	15,758	14,534	I. 1,224	8.2

* Deficit.

Early reports of monthly earnings are usually estimated in part, and are subject to correction by later statements.

Coal.

Coal tonnages for the week ending Jan. 23 are reported as follows:

	1887.	1886.	Inc. or Dec.	P. c.
Anthracite	489,792	647,157	D. 157,365	24.3
Eastern bituminous	258,798	220,564	I. 38,234	17.3
Coke	91,034	61,800	I. 29,234	47.3

The anthracite coal companies are still somewhat embarrassed by the coal-handlers' strike at the shipping points near New York. A large number of new men have been secured, but the work proceeds slowly. The longshoremen in New York have struck in support of the coal-handlers, hoping that outside pressure may be brought to bear on the coal companies in this way, to induce them to concede the demands of their own men.

Buffalo coal trade for the year ending Dec. 31 was as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Receipts:				
Anthracite	3,673,778	2,976,932	I. 696,846	23.4
Bituminous	1,450,955	1,532,058	D. 81,103	5.3
Total	4,124,733	4,508,990	D. 384,257	8.5
Shipments:				
Anthracite	1,552,060	1,496,000	I. 56,060	3.7
Bituminous	29,070	37,032	D. 7,962	19.9
Total	1,581,130	1,533,032	I. 48,098	3.2

Of the total receipts last year 4,042,788 tons came by rail, 81,445 by canal and 500 tons by lake. Of the shipments 1,562,080 tons were by lake and 19,878 tons by canal.

Cumberland coal shipments for the month to Jan. 29 were:

	1887.	1886.	Inc. or Dec.	P. c.
Balt. & Ohio R. R.	176,000	136,560	I. 39,440	28.9
Bedford Div., Pa. R. R.	7,567	21,447	D. 13,880	64.9
Total	184,167	158,013	I. 26,154	16.6

Local deliveries are included in the Baltimore & Ohio tonnage.

Actual tonnage passing over the Huntingdon & Broad Top road for the month ending Jan. 29 was:

	1887.	1886.	Inc. or Dec.	P. c.
Broad Top coal	33,960	20,082	I. 13,878	69.3
Cumberland coal	7,567	21,387	D. 13,820	64.9
Total	41,527	41,469	I. 58	0.1

The Broad Top coal is mined on the line; the Cumberland is carried through for the Pennsylvania Railroad.

The coke syndicate, controlling the business of the Connellsville region, has ordered an advance of 33 1/3 per cent. in prices of coke to consumers. This brings the price up to \$2 per ton for foundry and \$2.25 for furnace coke.

The coal tonnage of the Pennsylvania Railroad Division of the Pennsylvania Railroad for the month ending Jan. 29 was:

	1887.	1886.	Inc. or Dec.	P. c.
Coal	1,035,644	863,074	I. 172,570	19.0
Coke	351,547	218,468	I. 133,079	61.1
Total	1,387,191	1,081,542	I. 305,649	28.0

This includes all tonnage passing over the road.

St. Louis Traffic.

The St. Louis Globe-Democrat gives the following figures in relation to the St. Louis traffic during the last four years:

Coal received by all routes, either rail or water, in bushels:

	1886.	1885.	1884.	1883.
61,258,525	53,387,064	52,349,600	50,687,725	

The following receipts of anthracite coal are not included in the above:

	1886.	1885.	1884.	1883.
Tons	70,000	80,000	62,000	52,000

The coke receipts for the four years have been:

	1886.	1885.	1884.	1883.
Bushels	5,463,950	3,500,000	3,190,150	6,056,500

The general freights received at St. Louis during the four years were, in tons:

	1886.	1885.	1884.	1883.
By rail	7,111,020	6,761,168	6,440,787	6,940,723
By river	570,205	479,065	520,350	629,225
Total	7,681,225	7,240,233	6,961,137	7,569,948

In addition to the above, there was received the following tonnage of lumber, logs and shingles:

	1886.	1885.	1884.	1883.
From the Upper Mississippi	200,725	251,655	238,995	228,950
From the Missouri	60	2,195	1,335	2,335
Total	200,785	253,850	240,330	231,285

The total freight shipments from St. Louis during the four years have been, in tons:

	1886.	1885.	1884.	1883.
By rail	3,617,090	3,537,133	3,611,419	3,468,216
By river	561,895	534,175	514,910	677,340
Total	4,178,985	4,071,308	4,126,329	4,145,556

The shipments thus show a small increase over 1885, but hardly any change from 1884.

Cotton.

Cotton movement for the five months of the crop year from Sept. 1 to Jan. 28 is reported by the Commercial and Financial Chronicle as follows, in bales:

	1886-87.	1885-86.	Inc. or Dec.	P. c.
Receipts	1,886,069	2,029,274	D. 143,205	2.1
Shipments	1,862,788	1,568,782	I. 294,006	18.8
Stock, Jan. 28	351,361	470,342	D. 118,981	25.3

Receipts at the ports:

	1886-87.	1885-86.	1884-85.	1883-84.
To Jan. 28	4,346,172	4,113,246	4,126,992	3,981,316
Interior stocks on Jan. 28 in excess of Sept. 1	303,301	460,492	263,657	250,598

Net receipts from plantations:

	1886-87.	1885-86.	1884-85.	1883-84.
To Jan. 1	4,649,473	4,573,738	4,390,649	4,231,614
Net overland to Jan. 1	513,742	525,092	358,048	382,415
Southern consumption to Jan. 1	150,000	131,000	115,000	123,000
Total in sight Jan. 28	5,313,215	5,229,830	4,863,697	4,737,329

Northern spinners' take:

	1886-87.	1885-86.	1884-85.	1883-84.
To Jan. 28	1,098,230	1,151,009	880,880	976,791

"It will be seen by the above that the increase in amount in sight to-night, as compared with last year, is 53,385 bales, the increase as compared with 1884-85 is 449,518 bales, and the increase over 1883-84 is 575,886 bales."

Petroleum.

The production and shipments of the Pennsylvania and New York oil fields for December are given by Stowell's Petroleum Reporter as follows, in barrels of 42 gallons:

	1886.	1885.	Inc. or Dec.	P. c.
Production	2,181,625	1,898,657	I. 282,968	14.9
Shipments	2,550,801	2,138,251	I. 412,550	19.3
Stock, Dec. 31	34,156,605	34,428,841	D. 272,236	0.8
Producing wells	25,443	23,519	I. 1,924	8.1

Of the total production last December, the Allegheny District in New York furnished 6.7 per cent.; the Bradford District in Pennsylvania 25.6; the Warren District 15.4; the Lower District 37.7, and the Washington District 14.6 per cent.

Stock was diminished during the month by 369,266 barrels, that being the excess of shipments over production.

Shipments for the month were as follows, in barrels:

	Crude.	Refined.	Total.	P. c.
New York	620,739	62,903	683,642	26.8
Philadelphia	927,637	154,645	1,082,282	42.4
Baltimore	102,832	17,500	120,332	4.7
Boston	20,995	58,553	79,548	3.1
Cleveland	200,473	200,473	400,946	15.3
Pittsburgh	97,572	97,572	195,144	7.4
Local points	202,310	84,942	287,252	11.3
Total	2,172,378	378,513	2,550,891	100.0

In this table the refined oil is that treated at the Creek refineries in the oil regions; it is reduced to its equivalent in crude, so that the total represents the amount of crude oil shipped, whether in crude or in refined form.

The total production and shipments for the year ending with December have been, for four years:

	1886.	1885.	1884.	1883.
Production	26,381,596	20,776,041	25,278,693	23,128,389
Shipments	26,653,836	25,713,328	23,657,599	21,979,369
Stock, Dec. 31	34,156,605	34,428,841	37,369,126	35,745,632

Both production and shipments last year were the largest ever reported. The total increase in production last year over 1885 was 27 per cent.; in shipments, 12 1/2 per cent. In 1886 the shipments exceeded production by 272,236 barrels, and in 1885 by 2,687,285 barrels, while in 1884 production exceeded shipments by 1,620,494 barrels, and in 1883 by 1,149,020 barrels.

Rates on Through Traffic.

It is stated that the management of the Queen & Crescent (Cincinnati, New Orleans & Texas Pacific) system has advised shippers that hereafter no reduction will be made on through freights, but that local rates will be maintained for long as well as short hauls. It is thought that this action will have an injurious effect on important industries at the South which have heretofore been fostered by low rates on through business.

Second-Class Tickets.

Boston & Maine.—Bills have been presented in the legislatures of both Maine and Massachusetts authorizing this company to acquire by purchase the Eastern Railroad and its leased lines, the directors of the several companies to agree upon terms, subject to the approval of the stockholders. The bills also authorize the Boston & Maine to increase its capital stock and funded debt as may be necessary. It is understood that no objections will be made to the passage of the bills.

Chattanooga & Southeastern.—This company has filed articles of incorporation in Tennessee to build a railroad from Chattanooga to Columbus, Ga., with several branches.

Chicago, Burlington & Northern.—Surveys are being made for an extension of this company's Galena Branch, from Galena, Ill., to Shullberg, Wis., a distance of 15 miles.

Chicago, Oquawka & Kansas City.—This company has filed articles of incorporation to build a railroad from Lacon, Ill., on the Chicago & Alton, to Oquawka, and thence to the Mississippi River and to a connection with some line running to Kansas City. The office is in Chicago.

Chicago, St. Paul, Minneapolis & Omaha.—In the old suit brought to recover from this company, under a contract made by the old Chicago, Portage & Superior Co., for the construction of its road, the United States Court at Madison, Wis., has given judgment for \$351,965 in favor of Sarah R. Angle, widow and representative of H. G. Angle, the contractor. A motion for a new trial has been made.

Cincinnati & Eastern.—Arrangements are being made to begin work shortly on the extension of this road from Portsmouth, O., to Gallipolis.

Cincinnati, Florence & Aberdeen.—This company has been incorporated to build a railroad from Tullahoma, Tenn., to Florence, Ala., and thence to Aberdeen, Miss. The headquarters are at Florence.

Cincinnati, Hamilton & Dayton.—The following statement is made for the nine months of the fiscal year from April 1 to Dec. 31:

Earnings.....	\$2,309,022
Expenses (60.2 per cent.).....	1,398,677
Net earnings.....	\$910,345
Interest, etc.....	\$561,225
Dividends paid, 4 per cent.....	140,000
Surplus.....	701,225

A quarterly dividend of 2 per cent. has been declared on this showing, which will require \$70,000, leaving a balance of \$148,120 on hand.

Columbia & Puget Sound.—This company is having surveys made for an extension of its road from May's Creek, Wash. Ter., through the Squak Valley, into the Snoqualmie country. It is announced that construction will be begun as soon as the line is located.

Cumberland & Maurice River.—The controlling interest in this road has been purchased by the New Jersey Central Co. and the line will hereafter be operated as a branch of that company's New Jersey Southern Division. It extends from Bridgeton, N. J., to Port Norris, a distance of 30 miles.

Denison, Bonham & New Orleans.—This company has been organized at Denison, Tex., to build a railroad from that place through Bonham and Pittsburgh to Shreveport, La. A branch from Pittsburgh to Longview is also proposed.

Denver, Memphis & Atlantic.—Regular trains are now running on the Conway Springs Division of this road, from Belle Plaine, Kan., to Turon, a distance of 76.3 miles. The road is operated by the Fitzgerald & Mallory Construction Co., which has the contract for building the entire line.

Detroit, Charlevoix & Escanaba.—This company has been organized to build a railroad from Charlevoix, Mich., through Ironton and Mancelona to Grayling, a distance of 70 miles.

Dunleith & Dubuque Bridge Co.—A dispatch from Galena, Ill., Jan. 27, says: "Papers were filed in the Circuit Court in this city to-day ordering the Dunleith & Dubuque Bridge Co. to show cause why it should not be placed in the hands of a Receiver. The order is based on an alleged non-compliance on the part of the company with the terms of the act of Congress and its charter, granted by the state of Illinois, which provides for the construction of a railroad bridge extending from the Iowa shore to the Illinois shore, across the Mississippi River.

"The bridge company constructed its bridge from the Iowa shore, in Dubuque, to within some 60 ft. it is alleged, of the Illinois shore, and the gap there was filled by the Illinois Central Co., which owns and controls it, and, it being the only possible approach to the bridge, the Illinois Central is complete master of the situation, so far as any efforts of other roads to secure an approach is concerned, and can dictate to other companies the terms on which the Central will allow them to cross the bridge. The Chicago, Burlington & Northern brings the suit to secure the use of the bridge."

Elmira, Cortland & Northern.—This company's extension from Canastota, N. Y., to Camden is now nearly completed, and its engineers are making a survey for a further extension from Camden to Carthage. The people along the proposed line have promised a considerable amount in subscriptions to the projected line, and have also offered to give the right of way.

Emporia, Winfield & Fort Smith.—This company has filed articles of incorporation to build a railroad from Emporia, Kan., to Winfield, and through the Indian Territory to Fort Smith, Ark., a distance of about 375 miles.

Fitchburg.—This company has issued the following circular: "Pursuant to the consolidation agreement with the Commonwealth, Jan. 5, 1887, the directors of this company have this day issued 17,622 shares of preferred stock to shareholders of record Jan. 31, 1887, in proportion of one new share to three old shares. No payment on the new shares is required. The assignment and transfer of existing stock will not include the rights to the new stock after this date. No certificates will be issued for nor dividends paid on fractions, but to become available they must be evened up by sale or purchase, and presented to the Treasurer's office in 3s, or multiples thereof, as early as possible, in order to close the preferred stock accounts. Preferred stock certificates, including the old and the new issues, will be ready for exchange and delivery about March 1 next."

It is stated that application will be made to the Massachusetts Legislature to permit the substitution of \$5,000,000 plain or debenture bonds for the \$5,000,000 mortgage bonds which are to be delivered to the state in payment for the Troy & Greenfield road.

Gulf, Colorado & Santa Fe.—On the extension of this road northward to meet the Atchison, Topeka & Santa Fe the track is now laid for 23 miles northward from the Red River, which was the terminus at the close of the year.

Work is progressing rapidly and the company hopes to lay at least 30 miles in February and to complete this end of the line by May next.

Housatonic Valley.—This company, which was lately organized to build a railroad from Birmingham, Conn., to Sandy Hook, on the New York & New England road, has offered to purchase the interest of the city of New Haven in the New Haven & Derby road for \$175,000, giving also the guarantee that it will provide for the \$300,000 in first mortgage bonds. The city interest in the New Haven & Derby road includes a subscription of \$300,000 to the stock, a guarantee on \$225,000 bonds, a cash loan of \$75,000, and about \$145,000 accrued interest.

Hudson Connecting.—This company has been organized to build a railroad from New Paltz, N. Y., at the eastern end of the Poughkeepsie bridge over the Hudson River, southwest to a junction with the Wallkill Valley Road at Pine Bush, a distance of about 20 miles. The incorporators are all directors of the Poughkeepsie Bridge Co.

Indiana, Bloomington & Western.—In Chicago, Feb. 1, counsel for the Central Trust Co. made application to the United States Circuit Court for final decrees of foreclosure. The application was referred to a master, and the Court also granted leave to Henry Crawford to file an intervening petition on behalf of the second-mortgage and income bondholders.

Indiana, Illinois & Iowa.—A bill has been filed by Robert P. Ennis to set aside the foreclosure and sale under which this company acquired title to the graded road-bed and other property of the old Plymouth, Kankakee & Pacific Co. The plaintiff claims that the parties who acted for the bondholders at that time were not properly authorized, and that the sale was illegal and void.

Lakeside & Marblehead.—This road is now completed and in operation from the Lake Shore road near Danbury, O., to Marblehead, a distance of 8 miles. It is doing a good business hauling stone and other freight to and from the quarries and lime-kilns on the line. In summer a considerable passenger business is expected.

Maine Central.—The directors have ordered the extension of the double track from Portland to Cumberland Junction. The distance to be built is 7 miles, and the cost will be about \$125,000. It is between these points that the fast trains put upon that road to accommodate the summer travel are generally obliged to pass each other, and the absence of a double track heretofore has occasionally caused delay. The extension will be completed before the next summer timetable goes into effect. Besides this, it is probable also that a new union passenger station will be built in Portland this year. This will be the outcome of an agitation of the subject that has been going on for several years. A bill has already been presented to the Maine Legislature providing for the incorporation of a company of gentlemen representing the Boston & Maine and the Maine Central railroads for the purpose of erecting such a station.

The new station will be located at what is now known as the Congress street station, and if the present plans are carried out a station will be erected that will cost about \$125,000 exclusive of the land. The building will be arranged to accommodate the Boston & Maine, the Maine Central, the Portland & Ogdensburg, and the Portland & Rochester railroads, provided the Legislature authorizes the last-named road to extend its present tracks into the city of Portland. It is expected that work will be begun upon the new station at an early day.

Memphis & Charleston.—The statement for December and the six months of the fiscal year from July 1 to Dec. 31 is as follows:

	December.	1886.	1885.	Six months.	1886.	1885.
Earnings.....	\$177,797	\$158,934	\$849,632	\$728,525		
Expenses.....	142,510	99,237	537,179	477,907		
Net earnings.....	\$35,287	\$59,697	\$312,453	\$250,618		

For the half year the gross earnings increased \$121,107, or 16.6 per cent., and the expenses \$59,212, or 12.4 per cent., leaving a gain of \$61,895, or 24.6 per cent., in the net earnings.

Mexican Railroad Notes.—The following notes are from the Mexican Financier of Jan. 22:

The sub-company under which the Mexican Central branches will be built and fully equipped will probably be known as the Guadalupe & Tampico Railroad Co. The cost is expected to be about \$10,000,000, and though the Mexican Central officials are reticent as to the form of securities upon which the money is to be obtained, yet their plan will probably soon be announced.

Owing to the short corn crop in the northeastern part of the Republic, grain will have to be imported from the United States, as was also the case some few years since. Not long ago this section of the country was shipping corn over the National Railroad into Texas. As illustrating the benefits to be derived from railway construction, it may be stated that, at the present time, there is an abundance of maize on the Western Division of the National Railroad, and, were the main line of this road completed, the corn famine in the northeast could be relieved without the need of bringing in foreign grain. Corn is now being sent over the National's Western Division to Yucatan, via the Vera Cruz Railway.

Michigan & Ohio.—The United States Circuit Court has confirmed the sale of this road under foreclosure, and the reorganization can now be completed as proposed.

Minneapolis, Sault Ste. Marie & Atlantic.—Henry & Balch, the contractors for the extension of this road from Rhineland, Wis., to Sanders' Point, have put a force of men at work getting the timber from the right of way, and will soon have a considerable force at work on the grading.

Mississippi & Tennessee.—A meeting of the holders of consolidated bonds will be held at No. 17 Wall street, New York, Jan. 17, at 3 p. m. A statement of the financial condition and requirements of the company will be submitted.

New Albany & Eastern.—This company has been organized to build a railroad from New Albany, Ind., to Watson, on the Ohio & Mississippi, a distance of 8 miles.

New Maine Railroads.—The report of the Maine Railroad Commissioners gives the following statement of new railroads in that state:

"Rockport Railroad, from the village of Rockport to Lime-stone Quarry, 2.5 miles. Nearly completed.

"Sebasticon & Moosehead Railroad, from Pittsfield to Moosehead Lake; nearly completed from Pittsfield to Hartland, 8 miles. Trains are running from Pittsfield to Hartland at a low rate of speed. This portion of the road will be completed in the spring, and construction of second division, between Hartland and Harmony, commenced.

"Extension of Knox & Lincoln Railroad, at Rockland, 1 mile. Nearly completed. Trains are running to new station, near the business centre of the city.

"York Harbor & Beach Railroad, from Kittery to York Harbor, about 10 miles. Will be completed the coming summer.

"International Railway, about 18 miles. Nearly completed in this state.

"Projected railroad from Camden to Rockland, 9 miles."

New York, Lake Erie & Western.—This company's statement for December, and the three months of the fiscal year from Oct. 1 to Dec. 31 is as follows, the figures including 68 per cent. of the gross earnings and all the working expenses of the leased New York, Pennsylvania & Ohio road:

	December.	1886.	1885.	Three months.	1886.	1885.
Earnings.....	\$1,985,149	\$1,872,887	\$3,265,421	\$5,708,061		
Expenses.....	1,425,408	1,357,527	2,396,352	3,906,318		
Net earnings.....	\$559,741	\$515,360	\$1,972,169	\$1,799,743		

For the three months this shows an increase in gross earnings of \$502,460, or 8.7 per cent.; an increase in expenses of \$330,084, or 8.3 per cent.; and an increase in net earnings of \$172,426, or 9.6 per cent.

For the same periods the Erie lines proper (excluding all earnings and expenses of the New York, Pennsylvania & Ohio) make the following showing:

	December.	1886.	1885.	Three months.	1886.	1885.
Earnings.....	\$1,582,598	\$1,505,885	\$5,102,247	\$4,700,314		
Expenses.....	1,067,740	1,014,298	3,334,614	2,943,477		
Net earnings.....	\$514,858	\$491,587	\$1,867,633	\$1,756,837		

These lines show for three months an increase in gross earnings of \$401,933, or 8.6 per cent.; an increase in expenses of \$291,137, or 9.9 per cent.; and an increase in net earnings of \$110,796, or 6.3 per cent.

A comparison of the two statements shows that for the three months in 1886 the 68 per cent. of gross earnings of the leased road amounted to \$1,166,274, and its working expenses to \$1,061,738, showing a profit on the lease of \$104,536, against a similar profit of \$42,906 for the three months of 1885.

New York & New England.—The statement for the December and the three months of the fiscal year from Oct. 1 to Dec. 31 is as follows:

	December.	1886.	1885.	Three months.	1886.	1885.
Earnings.....	\$330,786	\$309,179	\$1,049,660	\$957,352		
Expenses.....	223,069	241,321	853,742	616,969		
Net earnings.....	\$97,687	\$67,858	\$395,918	\$341,383		

For the three months the gross earnings increased \$92,317, or 9.6 per cent., and the expenses \$57,743, or 6.1 per cent., leaving a gain of \$54,574, or 16.0 per cent., in the net earnings.

Northern Pacific.—The directors have voted to appropriate \$100,000 to buy seed wheat for farmers on the line in Dakota who lost their crops last year.

At the same meeting it is stated that the question of the lease of the Oregon Railway and Navigation Co.'s property was brought up, but no action was taken.

Ohio & Mississippi.—The Illinois Supreme Court, on appeal from the District Court, has decided that this company must obey the orders of the Railroad Commissioners to furnish better facilities for traffic on its Springfield Division, and especially to resume the running of two passenger trains. The Court orders that the directions of the Commission must be obeyed by Feb. 1 next.

Old Colony.—This company is replacing the 56-lb. rail between Randolph and North Easton with 67-lb. steel rails. The 56-lb. rails which are being taken up will be used on the Cape Cod Division. The company is also laying new 67-lb. rails near Raynham.

The handsome new station which is being erected by this company at Middleboro, Mass., is nearly completed and will soon be ready for occupancy.

Pennsylvania.—This company's statement for December shows for all lines east of Pittsburgh and Erie, as compared with December, 1885, an increase in gross earnings of \$381,534; an increase in expenses of \$342,553, and an increase in net earnings of \$38,981. For the twelve months ending Dec. 31, as compared with 1885, the same lines show an increase in gross earnings of \$4,764,043; an increase in expenses of \$3,139,830, and an increase in net earnings of \$1,624,213.

This gives the following statement:

	December.	1886.	1885.	Year.	1886.	1885.
Earnings.....	\$4,428,216	\$4,046,681	\$50,370,070	\$45,715,027		
Expenses.....	3,630,634	2,667,481	32,619,598	29,479,758		
Net earnings.....	\$1,398,182	\$1,379,200	\$17,750,472	\$16,135,269		
Per cent. of ex.	38.4	34.4	64.7	64.6		

All lines west of Pittsburgh and Erie for the twelve months of 1886 show a surplus over all liabilities of \$59,737, being a gain of \$1,152,711 as compared with the previous year.

This company is building a new storage warehouse for flour at the Broad street station in Philadelphia. The building will be 180 by 84 ft. in size and 5 stories high, with capacity for 1,000 barrels of flour on each floor. Mr. D. S. Cofrade, of Jersey City, is the contractor.

A London dispatch of Jan. 31 says: "The English shareholders in the Pennsylvania Railroad Co., at a meeting to-day, adopted resolutions declaring that the company should pay larger dividends on its net earnings. The net earnings of the road for the half year ending in November last, the resolutions state, justify the payment of a larger dividend than that declared. Mr. John Taylor reported that, from what he saw in Philadelphia, he was convinced that the company's accounts were kept in a very unsatisfactory manner."

Philadelphia & Reading.—This company, it is well known, has for twelve years past conducted its own express business, and has allowed no other express company to run over its lines and branches. It is now announced that a contract has been concluded under which the present system will be abandoned and the Adams Express Co. will do all the express business over the line. The contract dates from Feb. 1, and the transfer will be made as soon as the business of the Reading Express can be closed up. The Adams Express Co. takes all the express wagons and other plants at a valuation to be fixed by arbitration. This change, it is stated, will not effect the running of the Baltimore & Ohio Express to New York over the Reading line, as the Baltimore & Ohio contract covers express as well as passenger and freight business, but the Baltimore & Ohio Express will do no local business on the Reading line.

The new reorganization plan formulated by the general mortgage and income mortgage bondholders was issued Jan. 31. It is claimed that a number of New York capitalists have signified their willingness to come in under this plan, and will subscribe capital to a fund to be raised for the purpose of buying in the road at foreclosure sale.

The plan provides for the issue of \$44,000,000 new improvement mortgage 4 per cent. bonds to run for 50 years. Of this issue \$35,521,700 will be reserved for payment of the consolidated mortgage of 1871 and mortgages prior thereto, the improvement mortgage of 1873, and the real estate lines of the railroad company, leaving \$8,000,000 as a reserve for working capital, \$2,478,300 to redeem collaterals, and \$3,000,000 for betterments and equipments. A new general

mortgage of \$31,000,000 at 5 per cent., to run for 50 years, will be issued for present general mortgage bonds, and general mortgage and Perkiomen scrip and accrued interest to July, 1887; control of property to descend to next lower interest on which five years' consecutive interest has not been paid on receipt by this mortgage of its regular interest for five consecutive years.

Should it be found possible at the time of reorganization to sell at 95 and interest, or better, \$43,000,000 new general mortgage 4 per cent. bonds (part of the following mortgage), the right is reserved to do so and to pay off at \$100 and accrued interest all general mortgage bonds, also all improvement bonds subject to call. In that event, control of the railroad is to be held by the first preferred stock and descend as provided above. The mortgage will be for \$100,000,000 in new general mortgage 4 per cent. bonds, running 70 years, and taking up present issues and providing for betterments and equipments.

The income mortgage, consolidated adjustment scrip and debenture guarantee scrip will receive \$9,500,000 first preferred 5 per cent. stock, non-cumulative for three years, after paying an assessment of \$100 per \$1,000 bond, subject to payment at \$100 and accrued interest from date of issue on one year's notice. Each income bond, therefore, receives \$1,845 in first preferred stock, and the others \$1,305. First series 5s will receive \$7,000,000 of second preferred stock, or \$1,275 per bond, non-cumulative for three years, upon the payment of an assessment of \$100 per \$1,000 bond, convertible into common stock. No mortgage is to be created above the first and second preferred stock, except by majority vote of those stocks. Second series 5s will receive \$3,500,000 third preferred 5 per cent. non-cumulative stock, or \$1,325 per bond, after payment of assessment of \$150 per \$1,000 bond. Debenture and convertible bonds, and all guaranteed bonds with interest to July 1, 1887, will receive \$15,000,000 of fourth preferred 5 per cent. stock, non-cumulative, upon payment of assessment of \$150 per \$1,000 bond. Assessment on preferred, common and guaranteed stocks will have \$8,500,000 convertible into common stock; \$41,500,000 of new common stock, entitled to 5 per cent. dividends, are for preferred, common and guaranteed stocks; assessments \$10 per share on new stock; preferred stock to be rated at \$65, Schuylkill Navigation stock to subscribe on the basis of 1 share of Reading for 4 shares of Navigation common, and 1 Reading for 2 Navigation preferred. Deferred income bonds will pay \$25 per \$1,000 bond, getting in return an additional \$100 bond, stamped, assented and having the same rights in the new company as they had in the old. Holders of preferred and common stock will be entitled to subscribe to fifth preferred stock. The holder of each general mortgage bond will receive in new generals \$1,180, if 6 per cent. bond, and \$1,210 if 7 per cent. bond.

The new Reading Railroad Co. shall have the power to issue and sell all stocks, bonds, scrips, or issues of any kind that are not taken up by the owners thereof under this plan. This power, it is estimated, will bring into the treasury of the new company from \$3,000,000 to \$5,000,000, which, under the syndicate plan, now goes to the personal benefit of the syndicate. A committee of five shall be appointed to carry this plan into effect, three of whom shall be chosen from the general mortgage bondholders and two from the income mortgage bondholders, with power to add two from the first series of 5 per cent. bondholders, should they deem it advisable. The compensation of the Chairman shall not exceed \$6,000 a year, and that of other members \$3,000. The plan is based on foreclosure. The Real Estate Title Insurance & Trust Co. has consented to receive all bonds and stocks for safekeeping, issuing negotiable receipts for same, and receive all assessments, which they will hold subject to the order of the committee, for the sum of \$20,000. Assents to the plan will close on Feb. 21.

Philadelphia, Wilmington & Baltimore.—Holders of this company's plain 6s due April 1 next are notified that they will have the option until March 1 of exchanging them for registered 4 per cent. bonds having 80 years to run. The exchange may be made at the Treasurer's office in Philadelphia, or through Kidder, Peabody & Co., in Boston. All bonds not exchanged will be paid at maturity. The amount of these bonds outstanding is \$1,000,000.

Poughkeepsie Connecting.—This company has been organized to build a railroad from the eastern end of the Poughkeepsie bridge over the Hudson to a connection with the Newburg, Dutchess & Connecticut road at a point near Moore's station, a distance of about 10 miles. The incorporators are all connected with the Poughkeepsie Bridge Co.

Rome & Carthage.—The general line of this road, as at present indicated, is from Rome, N. Y., through the valleys of Wood and Canada creeks, and thence by Fish Creek and Sugar River to Carthage. There is considerable local enthusiasm over the projected line, and most of the right of way has been promised free of charge, besides some local subscriptions.

Rome & Decatur.—Tracklaying has been begun on this road and the rails are reported down for 4 miles from Rome, Ga. The first engine was received on Jan. 26, and was at once put on the road with a construction train.

Sacramento Valley & Humboldt Bay.—This company has been incorporated in California to build a railroad from a point on the Oregon Division of the Central Pacific, near Red Bluff, Cal., to a point on Humboldt Bay, a distance of 130 miles. A branch from Oak Creek to Paskanta is also proposed.

St. Cloud, Duluth & Ortonville.—This company has been incorporated to build a railroad from St. Cloud, Minn., across the state to Ortonville, with a branch from a point near St. Cloud to Duluth. The principal office is at St. Cloud.

St. Louis, Arkansas & Texas.—A St. Louis dispatch of Feb. 2 says: "A corps of engineers will leave here to-morrow for Bird's Point, Mo., opposite Cairo, to reconnoitre the country northward in the interest of the St. Louis, Arkansas & Texas Railway. The party will move up the west side of the Mississippi River until they reach Grandtown, where they will separate, and one-half of them will come up on the east side of the river to East St. Louis. The management have but little hope of finding a desirable route on the west side of the river because of the great cost of securing an entrance into St. Louis. It is estimated it would cost about \$5,000,000 to bring their line from South St. Louis to the Union Depot in this city."

On the new Sherman Branch of this road the track is now laid from the main line at Mt. Pleasant, Tex., westward to Mt. Vernon, a distance of 16 miles, and the work is progressing steadily.

St. Louis & Missouri Central.—This company has been formed by the consolidation of the St. Louis & Kansas City Short Line and the Missouri Central companies. Both of these companies were organized and have done some work on new lines between St. Louis & Kansas City, but neither has any completed road. There is a report that the consolidated company will have the backing of the Cleveland, Columbus, Cincinnati & Indianapolis Co., but it needs confirmation.

St. Louis & San Francisco.—Track on the extension of this road from Fort Smith, Ark., southward, is now completed to Winding Stairs, a distance of 80 miles from Fort Smith, and the grading is completed for some distance further.

San Antonio & Aransas Pass.—The Waco Branch is now completed to Cuero, Tex., 17 miles east of the late terminus at Yorktown, 42 miles from the main line at Kenedy Junction, and 105 miles from San Antonio. Trains are running to the new terminus.

Shenandoah Valley.—A report at some length has been issued to the first mortgage bondholders by their committee, of which Mr. Geo. C. Wood, of New York, is Chairman. This report refers to the claim that \$1,560,000 of unissued first mortgage bonds were deposited with the trustee of the general mortgage as security for that mortgage. The committee states that "on Dec. 30, 1886, at the sitting of the Court at Roanoke, your Chairman and counsel of the committee being present, the Master announced his findings and presented his report, which was read and examined by the counsel of the several interests, but the report has not yet been formally filed of record. The Master in his report finds substantially in our favor: First, that the first mortgage is a lien upon the entire railroad property and branches constructed between Hagerstown, Md., and Roanoke, Va., in length 255 miles; secondly, that the \$1,560,000 of bonds claimed to be held for the benefit of the general or second mortgage are invalid, and that the valid outstanding first mortgage bonds are limited to \$3,370,000, and interest due thereon of \$301,350, as of the date of Sept. 24, 1886; thirdly, that the car trust, equipment and locomotive contracts have priority of lien over mortgage indebtedness to the amount of \$779,436 of the date of Sept. 26, 1886. While this equipment debt is declared a prior lien, it is no longer a practical question, as it is estimated the equipment is worth the unpaid balance of \$779,436, and it is necessary to the operation of this road. The Master reports receivers' certificates outstanding of that date \$800,000; and since the finding of his report there have been authorized by the Court additional certificates in amount \$100,000, the proceeds to be applied to the purchase of steel rails, etc. The Master reports general mortgage bonds outstanding in amount \$4,118,000; interest due as of April 1, 1886, \$359,460. Upon suggestion in open court, and with consent of all the counsel, the Court assigned March 1, 1887, as the day for argument upon the report." Bondholders are called on to deposit their bonds with the Central Trust Co. in New York.

Southern Pacific.—On the southern end of the new coast line track is now laid for 35 miles northwestward from the junction with the main line at Newhall, Cal., and the grading is nearly completed to San Buenaventura.

Strikes.—A small strike on the Atlantic & Pacific road on Jan. 30 was quickly ended by agreement. The strike was caused by an order requiring freight brakemen to remain at all times on top of their trains. This order was modified.

The Chicago switchmen of the Chicago & Atlantic road struck Jan. 28, on account of the discharge of a member of their union for a technical violation of the rules. The Superintendent found that the grounds for the discharge were not sufficient, and he at once gave orders that the man be re-employed. When the strikers were notified of his reinstatement they demanded that the informer be dismissed; also that the "letter" system, which was established after the Lake Shore strike last summer, be abolished forever. The men claimed in support of this that the system imposed double work upon all experienced switchmen. Under the letter system a man was given employment, and after he had worked three or four days he was asked to produce a letter from his former employers testifying to his good character. In nine cases out of ten the men did not have letters and they were dismissed without a word of explanation. Late in the afternoon these demands were laid before the General Manager, who consented to receive a committee of the strikers and, after listening to their complaints, agreed to order the discharge of informer and the abolition of the obnoxious letter system if the strikers would return to work immediately. The committee agreed, and business was at once resumed.

The coal handlers' strike at New York this week assumes formidable proportions. The longshoremen employed on all the docks in the city in loading and unloading vessels all stuck in support of the coal handlers, intending in this way to bring outside pressure to bear upon the coal companies. This does not promise to be successful, however, as the latter decline to give way, and the steamship companies are making efforts to secure other laborers. On Feb. 1 the freight handlers employed at the railroad piers in the city and in Jersey City struck also, putting a stop to the handling of freight as well as coal. Freight has been loaded and unloaded, however, by the help of such forces as could be picked up, and there has not been by any means a blockade, although there has been a good deal of delay and confusion.

The managers of the strike threaten a general strike of brakemen and switchmen, and also an extension of the movement to the coal miners, in case their demands are not complied with by the companies.

Tombigbee.—This new company has completed an organization and has put engineers in the field to survey and locate the line of the road from Columbus, Miss., to some point on the Tennessee River. The road will run through the Warrior coal fields, and will connect with the Kansas City, Memphis & Birmingham road.

Union Pacific.—This company has caused to be organized in Kansas 12 subordinate companies, for the purpose of building branches of its line. These branches are as follows:

1. From Concordia, in Cloud County, to Eldorado, in Butler County.
2. From Lincoln, in Lincoln County, to the Nebraska line.
3. From Lincoln to Great Bend.
4. From Concordia to Bellevue, and thence to the Colorado line.
5. From Lawrence to Kiowa in Barber County.
6. From McPherson to the Nebraska line.
7. From Minneapolis, in Ottawa County, to the Nebraska line.
8. From Lincoln Centre to the southwest corner of the state.
9. From Hays City, southwest to the Colorado line, with a branch to Wallace.
10. From Blue Rapids to Solomon.
11. From Manhattan to the Nebraska line.
12. From Beloit, in Mitchell County, to the Nebraska line.

Wilmington & Coast.—The engineers are locating this line from Wilmington, N. C., to Wrightsville, a distance of 8 miles, and work will be begun very soon.

Williamsburg & North Adams.—Surveys are being made for this road from Williamsburg, Mass., westward to North Adams. The line will connect at Williamsburg with the New Haven & Northampton road, but that company is not interested in the project.

Worcester & Hudson.—Arrangements are in progress to organize this company to build a railroad from Worcester, Mass., to Hudson, to connect with the Central Massachusetts. The distance is about 19 miles.

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Norfolk & Western.

This company owns a line from Norfolk, Va., to Bristol, 408 miles, with 136 miles of branches. An advance statement has been published for the year ending Dec. 31.

During the year the Cripple Creek Branch, 24 miles, was added to the road.

Trains ran 3,137,039 miles last year, carrying 400,269 passengers 19,580,000 miles, and 1,554,359 tons of freight 402,800,863 miles; an increase of 2 per cent. in passenger-mileage and of 36 per cent. in ton-mileage. The through ton-mileage increased 14 per cent.; the local increased 45 per cent.

The average earnings per passenger-mile were 3.122 cents gross and 1.174 net, against 3.027 and 1.250 in 1885; per ton-mile, 0.656 cent gross and 0.264 net, against 0.741 and 0.298 in 1885.

The earnings for the year were as follows:

	1886.	1885.	Increase.	P. c.
Earnings.....	\$3,252,054	\$2,771,121	\$480,933	17
Expenses.....	1,960,002	1,649,262	311,617	19
Net earnings.....	\$1,291,147	\$1,121,859	\$169,218	15
Gross earn. per mile.....	6,302	5,433	869	16
Net ".....	2,502	2,200	302	14
Per cent. of exps.....	65	56	9	...

The increase in passenger earnings was 5 per cent.; in freight, 21 per cent.

The present statement does not give the amount of fixed charges; in 1885 they were about \$1,140,000, and were probably not much larger in 1886.

The increase in expenses was due to the large increase in coal and other mineral traffic, which is necessarily carried at low rates.

Camden & Atlantic.

This company owns a line from Camden, N. J., to Atlantic City, 59.8 miles, with 19.4 miles of branches. It also operates a ferry across the Delaware from Camden to Philadelphia. The statement is for the year ending Dec. 31.

The earnings for the year were as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Earnings.....	\$599,090	\$561,346	\$37,744	6.7
Expenses.....	469,315	427,268	42,112	9.9
Net earnings.....	\$129,775	\$134,143	D. \$4,368	3.2
Gross earn. per mile.....	7,564	7,088	476	6.7
Net ".....	1,639	1,094	545	53.2
Per cent. of exps.....	78.3	76.1	2.2	...

Interest, rentals, etc., last year amounted to \$97,774, leaving a surplus of \$32,001 for the year.

Detroit, Lansing & Northern.

This company owns a line from Detroit, Mich., to Howard City, 160.6 miles, with 100.4 miles of branches; a total of 261 miles. The statement is for the year ending Dec. 31.

The earnings for the year were as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Earnings.....	\$1,236,536	\$1,228,471	D. \$1,935	0.2
Expenses.....	727,819	771,371	D. 43,552	5.6
Net earnings.....	\$498,717	\$457,200	\$41,517	9.1
Gross earn. per mile.....	4,692	4,719	D. 27	0.2
Net ".....	1,911	1,753	158	9.1
Per cent. of exps.....	59.3	62.8	D. 3.5	...

Renewals included 1,175 tons of steel rails. Charges amounted last year to \$265,985, leaving a surplus of \$232,732. From this surplus there have been paid or declared dividends of 7 per cent. on preferred and 3 per cent. on common stock, amounting in all to \$280,465, leaving a surplus of \$2,267 for the year.

Delaware, Lackawanna & Western.

This company issues the following advance statement for the year ending Dec. 31, the figures including the operations of its great system of railroads and also of its extensive coal properties:

	1886.	1885.	Inc. or Dec.	P. c.
Earnings.....	\$32,342,865	\$31,091,678	\$1,251,187	4.0
Expenses.....	24,954,433	23,220,572	1,733,861	7.5
Net earnings.....	\$7,388,432	\$7,871,106	D. \$482,674	6.1
Interest and rentals.....	5,186,711	5,187,089	D. 378	...
Balance.....	\$2,201,721	\$2,684,017	D. \$482,296	17.9
Construction, etc.....	164,029	443,183	D. 279,154	63.0
Profit.....	\$2,037,692	\$2,240,834	D. \$203,142	9.1

The net profit was equal to 7.77 per cent. on the stock last year, against 8.55 per cent. in 1885. Dividends paid were 7 per cent., against 7½ per cent. in 1885.

West Jersey.

This company owns a line from Camden, N. J., to Cape May, 81.5 miles, with 118.7 miles of branches; a total of 200.3 miles. The statement is for the year ending Dec. 31.

The earnings for the year were as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Earnings.....	\$1,352,478	\$1,286,012	\$66,466	5.2
Expenses.....	\$40,184	\$69,395	D. 29,789	4.9
Net earnings.....	\$503,274	\$476,617	\$26,657	5.6
Gross earn. per mile.....	6,755	6,424	331	5.2
Net earn. per mile.....	2,514	2,381	133	6.6
Per cent. of expenses.....	62.8	62.9	D. 0.1	...

The interest and rentals last year amounted to \$308,290, leaving a surplus of \$190,984 for the year. From this surplus \$12,500 were paid to the sinking fund, and dividends of 6 per cent. were paid on the stock.

St. Louis, Vandalia & Terre Haute.

This company owns a line from the Illinois State line near Terre Haute, Ind., to East St. Louis, 158.3 miles. It is leased to the Terre Haute & Indianapolis Co., but a separate report is made for the year ending Oct. 31.

The company has \$3,379,358 common stock; \$1,544,700 preferred stock; \$1,809,000 first-mortgage 7s, and \$2,600,000 second-mortgage 7s.

Trains ran 1,479,597 miles last year, carrying 317,485 passengers 19,023,841 miles, and 1,498,688 tons of freight 111,851,653 miles. The average rates were 2.34 cents per passenger-mile and 0.70 cent per ton-mile.

The earnings for the year were as follows:

	1885-86.	1884-85.	Increase.	P. c.
Earnings.....	\$1,478,930	\$1,372,647	\$106,283	7.8
Expenses.....	1,011,144	971,684	39,460	9.7
Net earnings.....	\$467,186	\$400,963	\$66,223	16.5
Gross earnings per mile.....	9,339	8,071	1,268	15.7
Net earnings per mile.....	2,951	2,840	102	3.6
Per cent. of expenses.....	68.4	67.1	1.3	...

The rental was \$443,490, leaving a profit of \$23,687 to the lessee. From the rental the company paid interest, etc., amounting to \$370,691, leaving a surplus of \$73,808 for the year.